EXTRACTED VERSION

OPERATION REDWING

Program II
Nuclear Radiation and Effects
Consolidated Program Book

Final Edition

Headquarters Field Command
Armed Forces Special Weapons Project
Sandia Base, Albuquerque, New Mexico

February 1956

NOTICE

This is an extract of Operation REDWING, Program II, Nuclear Radiation and Effects, which remains classified SECRET/ RESTRICTED DATA as of this date.

Extract version prepared for:

Director
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This report has had the classified information removed and has been republished in unclassified form for public release. This work was performed by Kaman Tempo under contract DNA001-79-C-0455 with the close cooperation of the Classification Management Division of the Defense Nuclear Agency.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Program II Consolidated Book is as complete and integrated a picture of the Program as has been possible to put together. The Book is intended for use by the various projects within the Program although some copies will receive other distribution. This is a means by which objectives, methods, and required support can be checked and rechecked to insure a good understanding of what is involved prior to leaving the ZI. It then forms a valuable reference to support functions and operational plans during the field and roll-up phases.

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FOREWORD

This report has had classified material removed in order to make the information available on an unclassified, open publication basis, to any interested parties. This effort to declassify this report has been accomplished specifically to support the Department of Defense Nuclear Test Personnel Review (NTPR) Program. The objective is to facilitate studies of the low levels of radiation received by some individuals during the atmospheric nuclear test program by making as much information as possible available to all interested parties.

The material which has been deleted is all currently classified as Restricted Data or Formerly Restricted Data under the provision of the Atomic Energy Act of 1954, (as amended) or is National Security Information.

This report has been reproduced directly from available copies of the original material. The locations from which material has been deleted is generally obvious by the spacings and "holes" in the text. Thus the context of the material deleted is identified to assist the reader in the determination of whether the deleted information is germane to his study.

It is the belief of the individuals who have participated in preparing this report by deleting the classified material and of the Defense Nuclear Agency that the report accurately portrays the contents of the original and that the deleted material is of little or no significance to studies into the amounts or types of radiation received by any individuals during the atmospheric nuclear test program.

FOREWORD

Program II has the Department of Defense responsibility for the proper prosecution of the Nuclear Radiation and Effects Program in Operation REDWING. This is essentially two programs: One which is concerned with the distribution of radioactivity in the cloud resulting from nuclear explosions and the subsequent fall-out of material from the cloud; and the other which is concerned with various nuclear radiation effects. Projects involved with the fall-out study are numbered 2.6x and all projects are numbered 2.y.

The Program II Consolidated Book is as complete and integrated a picture of the Program as has been possible to put together. The Book is intended for use by the various projects within the Program although some copies will receive other distribution. This is a means by which objectives, methods, and required support can be checked and rechecked to insure a good understanding of what is involved prior to leaving the ZI. It then forms a valuable reference to support functions and operational plans during the field and roll-up phases.

Changes can be anticipated in schedule, participation and mode of operation. In the case of Part III, SHOT SCHEDULE, considerable effort is being directed toward firing CHEROKEE and ZUNI in May. FLATHEAD may be delayed to the end of June with NAVAJO and APACHE advanced in the month of June. INCA may be fired on SALLY and KICKAPOO now scheduled for SALLY may be fired on PEARL. There may be changes in the TEWA participation by the 2.6x projects since this shot was added just a few days prior to publication and details had not been fully developed. Also in the formative stage is the evaluation of "salting" on some shots by Projects 2.62, 2.63 and 2.65. Changes in other detail can be expected, for example, the rocket trajectories given in Figure 2.61-3 are not firm and will be under development at the White Sands Proving Ground until approximately 1 March 1956.

Based on general project scope provided by the Chief, AFSWP and Project Status Reports a "First Edition" was prepared and distributed in mid-January 1956 for review by all project officers. This "Final Edition" is the result of the corrections from this review and the compromises required to meet field operational requirements. The book has been prepared by the Program II Staff consisting of: Maj J. A. Chiment, USA; Capt L. E. Killion, USAF; YN1 W. Wallace; YN3 W. D. LaClair and Pvt V. A. J. Van Lint, USA.

D. C. CAMPBELL, CDR, USN
Director, Program II

15 Feb 56

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SECTION I - B

PROGRAM TWO. PROJECT AGENCIES AND PROJECT OFFICERS

PROJECT	AGENCY	PROJECT OFFICER	ASSIST PROJECT OFFICER	CITY	PROJECT OFFICER'S TELEPHONE
2.1	SCEL/ESL	Mr. P. Brown	Mr. R.G. Larrick	Belmar, N.J.	Asbury Park Exch., Prospect 5-3000,Ext 61212
2.2	SCEL/ESL	Mr. P. Brown	Mr. Eric C. Ellstrom	Belmar, N.J.	Asbury Park Exch., Prospect 5-3000,Ext 61212
2.4	ACC/CWL	Mr. J.C. Maloney	Mr. M. A. Schmoke	ACC, Md.	Edgewood 1000, Ext 6145
2.51	ACC/CWL	Dr. B. Barnett	Capt C.W. Luke, USA	ACC, Md.	Edgewood 1000, Ext 6145
2.52	SANDIA CORP.	Mr. T.C. Looney	Mr. W.E. Pafford	Sandia Base Albuquerque, N. Mex.	Albuquerque 6-4411 Ext. 4-3157
2.61	NRDL	Mr. R.R. Soule	Mr. T.T. Shirasawa	SanFran,Cal.	Mission 8-6900,Ext 483
2.62	ONR/SIO	Mr. F. Jennings	Prof. J.D. Isaacs	La Jolla,Cal	Glencourt 4-4214, Ext 45
2.63	NRDL	Dr. T. Triffet	Dr. I.M. Werner	SanFran,Cal.	Mission 8-6900, Ext 483
2.64	USAEC/NYOO	Mr. R.T. Grayeson	Mr. M.F. Cassidy	NYC, N.Y.	Plaza 7-3600, Ext 79
2.65	ACC/CWL	Mr. M. Morgenthau	Capt W.W. Shaw, USA	ACC, Md.	Edgewood 1000, Exts. 24209 and 21228
2.66	ARDC/AFSWC	Col E.A.Pinson,USAF	Capt P.M. Crumley,USAF	Kirtland AFB Albuquerque, N. Mex.	Albuquerque 7-1711, Ext. 3254 or 2883
2.7	NRDL	Mr. H.R. Rinnert	Mr. M.M. Bigger	SanFran,Cal.	Mission 8-6900, Ext 515
2.8	NRDL	Mr. R.H. Heiskell	Mr. R.J. Crew	SanFran,Cal.	Mission 8-6900, Ext 524
2.9	BUSHIPS(588)	Mr. F.S. Vine	Mr. W.L. Owen	Wash. D.C.	Liberty 5-6700, Ext 6203
2.10	NRDL BUSHIPS	Mr. M. M. Bigger	Capt C.G. Molumphy,USN	SanFran.Cal.	Mission 8-6900, Ext 515

SCEL - Signal Corps Engineering Laboratory
ESL - Evans Signal Laboratory
ACC - Army Chemical Center
CWL - Chemical Warfare Laboratories
NRDL - Naval Radiological Defense Laboratory
ONR - Office of Naval Research
SIO - Scripps Institute of Oceanography
NYOO - New York Operations Office
ARDC - Air Research and Development Command
AFSWC - Air Force Special Weapons Center

PART II
PROJECT DETAIL

SECTION II

PROJECT DETAIL

PROJECT - 2.1 TITLE: Gamma Exposure vs. Distance

AGENCY: SCEL/ESL

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD. HURON [ ] NAVAJO, APACHE [ ]

= =

Objectives:

1. To determine gamma exposures as a function of distance from the point of detonation [ ]

2. To draw conclusions from the data concerning dosage contours for various types of detonations and the validity of various scaling laws.

Description and Experimental Procedures:

1. Standard film badges (B) and quartz fiber dosimeters (D) will be distributed at various stations on the Bikini Atoll, and on the ships stationed downwind in the fall-out area. Some of these stations will be coincident with Project 2.2 stations, and others, including those on the ships, will be coordinated with Project 2.65 stations. At some of the stations chemical vial detectors (V) will also be placed to extend the range of sensitivity and to furnish cross calibration checks. Some of the film badges will be provided with automatic dropping mechanisms which will actuate approximately one minute after the arrival of the positive shock front. These mechanisms will cut off the exposure; hence the films will record the total initial radiation and will not be appreciably affected by the residual radiation from radioactive fall-out.

2. At some stations a series of 8 quartz fibre dosimeters (I) will be exposed in sequence in order to measure the initial gamma radiation during 8 discrete time intervals. The sequence will be initiated by either the shock or thermal pulse.

3. A 200 curie source will be procured for calibration purposes and will be shared with other projects. The film badges have a sensitivity range up to 25,000 r. They will be processed in the RadSafe Laboratory on ELMER.

Station Locations:

The station locations and the detectors placed at each station are indicated in Table 2.1-1 and on Fig. 2.1-1 and Fig. 2.1-2.

TABLE 2.1-1

PROJECT 2.1 STATIONS

CODE

B: Film Badge
D: Quartz Fiber Dosimeter
V: Chemical Vial
I: Initial Gamma vs. Time
C: CASTLE Station Number

STATION#	ISLAND	COORDINATES		PARTICIPATION		
		N	E	CHEROKEE	ZUNI	APACHE, FLATHEAD HURON, NAVAJO
212.01	ABLE	169,900	71,350	IBVD	BD	BVD
212.02	CHARLIE	172,280	79,335	IBVD	BD	BVD
212.03	DOG	168,520	116,850	BVD	BD	IBVD
212.04	EASY	170,200	121,500	BVD	BD	IBVD
212.05	FOX	170,700	125,260	BVD	BD	IBVD
212.06	GEORGE	168,100	131,150	BVD	BD	IBVD
211.01	DOG Pt.1	169,520	117,680	BVD	BD	IBVD
211.02	DOG					
	Causeway	169,830	120,140	BVD	BD	IBVD
211.03	EASY					
	Causeway	170,530	123,360	BVD	BD	IBVD
211.04	FOX					
	Causeway	170,200	128,030	BVD	BD	IBVD
222.01	DOG Bunker	168,598	116,705	BD	BD	BVD
222.02	GEORGE					
	Bunker	169,373	130,473	BD	BD	BVD
C220.01	UNCLE	99,938	99,994	BDV	BDV	BD
220.08	OBOE	103,475	126,245	BDV	IBDV	BD
220.09	ROGER	100,942	117.269	BDV	IBDV	BD
220.14	PETER	101,516	121,499	BDV	IBDV	BD
C221.01	WILLIAM	109,009	79,868	BDV	BDV	BD
C221.02	YOKE	116,550	70,091	BDV	BDV	BD
C221.04	ALFA	124,113	58,974	BDV	BDV	BD

TABLE 2.1-1. (Cont'd)				PARTICIPATION		
STATION#	ISLAND	COORDINATES N	E	CHEROKEE	ZUNI	APACHE, FLATHEAD HURON, NAVAJO
C210.08	East of CHARLIE	168,675	92,527	All Shots - BDV		
C210.09	East of CHARLIE	168,203	94,022	"		
C210.10	East of CHARLIE	167,751	95,475	"		
C210.11	East of CHARLIE	167,303	96,918	"		
C210.15	EASY	170,116	121,447	"		
C210.16	GEORGE	167,173	131,558	"		
C210.17	FOX	170,559	124,857	"		
C210.18	FOX	170,707	126,875	"		
C210.19	FOX	170,470	127,067	"		
C210.20	GEORGE	169,475	129,645	"		
C210.21	GEORGE	168,341	130,906	"		
210.22	OBOE	103,085	127,078	"		
210.23	OBOE	103,457	126,249	"		
210.24	OBOE	102,510	126,510	"		
210.25	OBOE-PETER	102,151	124,670	"		
210.26	PETER	101,329	123,224	"		
210.27	PETER	101,498	121,502	"		
210.28	PETER-ROGER	101,102	120,249	"		
210.29	ROGER	100,942	118,764	"		
210.30	ROGER	100,918	117,272	"		
210.31	ROGER	100,153	117,313	"		
210.32	UNCLE	98,337	102,538	"		
210.33	UNCLE	99,669	100,900	"		
210.34	UNCLE	99,926	99,999	"		
210.35	UNCLE	100,056	99,365	"		
210.36	UNCLE	99,907	97,811	"		
210.37	WILLIAM	109,007	79,841	"		
210.38	YOKE	116,553	70,064	"		
210.39	ZEBRA	121,950	62,321	"		
210.40	ALFA	124,109	58,984	"		
210.41	BRAVO	127,233	56,691	"		
C210.56	PETER	100,801	121,799	"		
C210.63	OBOE	Unknown		"		
C210.64	OBOE-PETER	"		"		
C210.65	PETER	"		"		
C210.66	PETER	"		"		

TABLE 2.1-1.(Cont'd)				PARTICIPATION		
STATION#	ISLAND	COORDINATES N	E	CHEROKEE	ZUNI	APACHE, FLATHEAD HURON, NAVAJO
C210.67	PETER-ROGER	Unknown		All Shots - BDV		
C210.68	ROGER	"		"		
C210.69	ROGER	"		"		
C210.70	SUGAR	"		"		
C210.71	SUGAR	"		"		
C210.72	HOW	"		"		
C210.73	LOVE	"		"		
	NAN	"		"		
				ALL PARTICIPATING BIKINI SHOTS		
		PROJECT 2.65 STATIONS				
268.02	CHARLIE	172,500	80,950	BDV		
268.04	DOG	169,750	117,000	"		
268.06	GEORGE	168,900	131,050	"		
268.08	HOW	147,820	171,050	"		
268.10	LOVE	124,700	178,250	"		
268.11	NAN	104,461	178,946	"		
268.13	OBOE	102,900	126,393	"		
268.16	UNCLE	98,194	99,994	"		
	YAG 39			"		
	YAG 40			"		
	LST 611			"		
				PARTICIPATION - LACROSSE		
270.05	WILMA	Unknown		BDV		
270.06	BRUCE	"		"		
270.07	LEROY	"		"		
270.08	MACK	"		"		

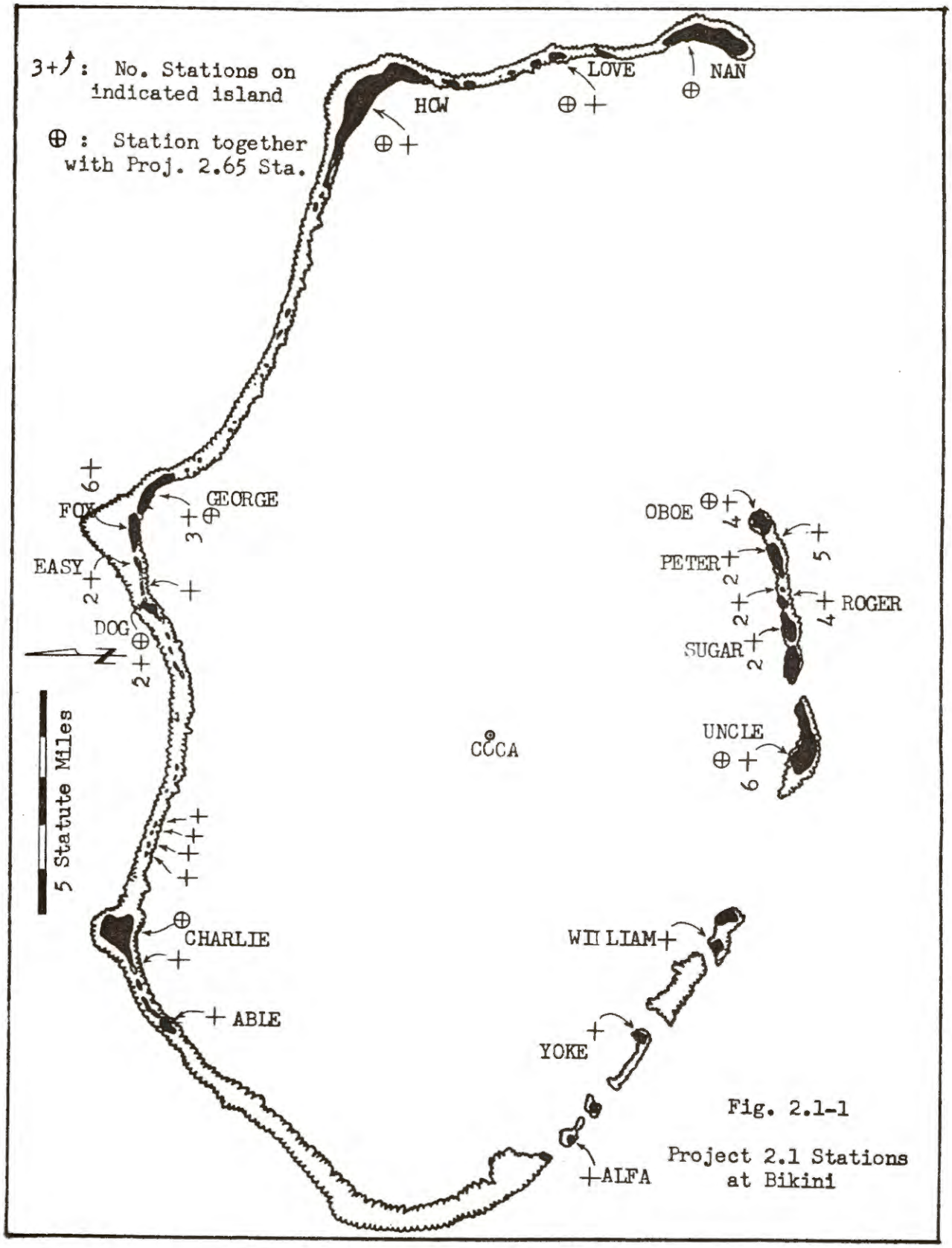

Fig. 2.1-1

Project 2.1 Stations at Bikini

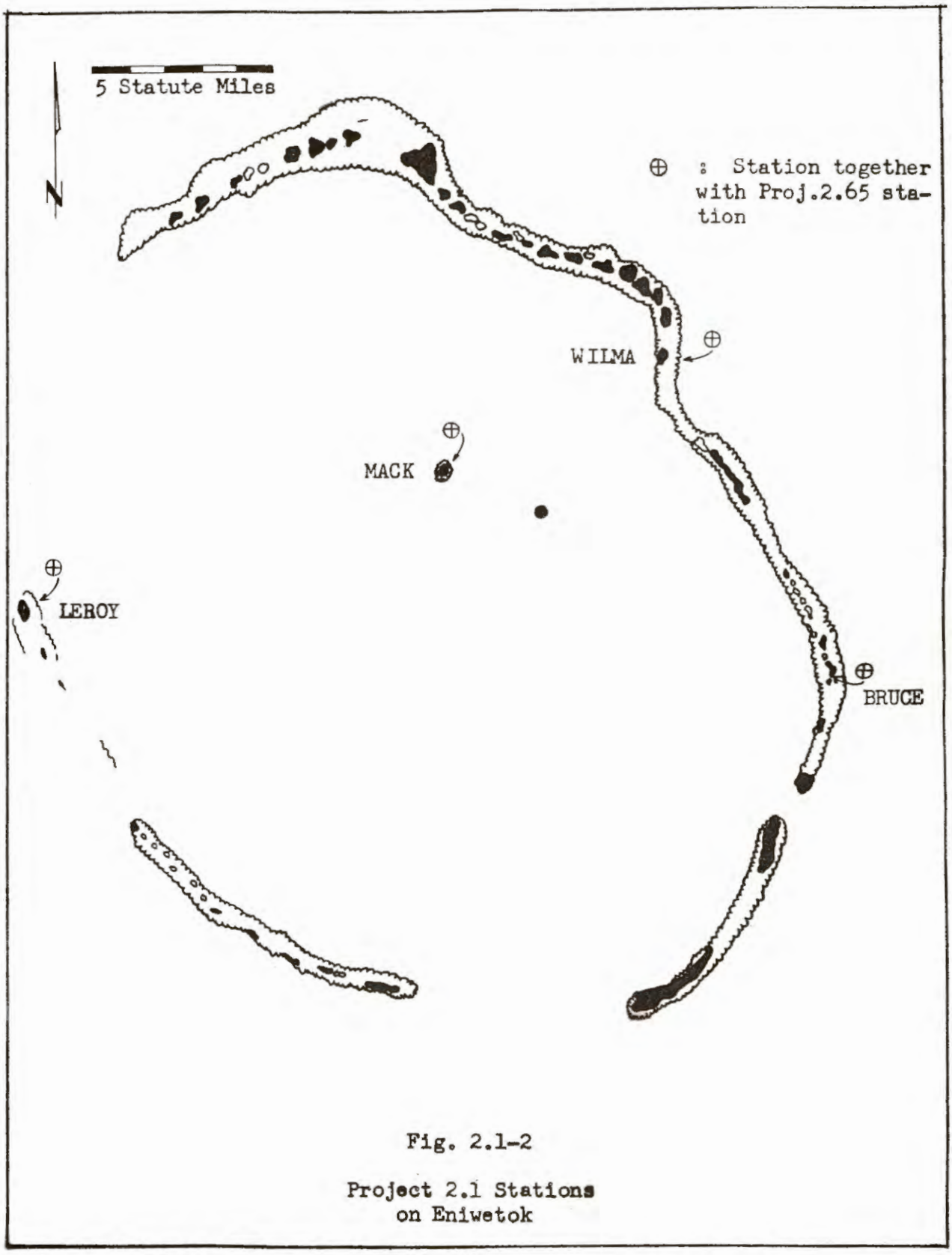

Fig. 2.1-2

Project 2.1 Stations on Eniwetok

SECTION II

PROJECT DETAIL

PROJECT - 2.2 TITLE: Gamma Rate vs. Time.

AGENCY: SCEL/ESL

PARTICIPATION: CHEROKEE. ZUNI, FLATHEAD, HURON NAVAJO, APACHE

Objectives:

1. To measure the initial gamma intensity as a function of time from the detonation.

2. To measure residual gamma intensity as a function of time at land fall-out stations.

3. To test a thermal radiation detector as a warning device.

Description and Experimental Procedures:

1. The initial gamma dose rate vs. time (J) will be detected by crystal scintillator - photomultiplier detectors with electronic circuitry which produces a log type output. The Sanborn and Cook Recorder will have a time resolution of 0.01 sec and can record for 5 min. It will record intensities varying from 10^3 to 10^9 r/hr.

2. Residual and fall-out gamma rate (R) is to be measured with ionization chamber instruments and associated electronics, the output of which consists of pulses, the pulse rate being proportional to the gamma rate. Data will be recorded on Esterline Angus Recorders modified for pulse recordings.

3. A portable thermal radiation detector (T) will be placed on NAN Island to evaluate its usefulness as a warning device.

4. All equipment will be calibrated before installation at the stations and again when it is recovered. The recovery will be performed as soon as radiological conditions permit. Installation and recovery will be coordinated with Projects 2.1 and 2.65 where possible.

Station Locations:

The station locations are indicated in Table 2.2-1 and on Fig. 2.2-1. Fig. 2.2-2 indicates the location of the YAG sampling platforms where residual radiation detectors will also be placed.

TABLE 2.2-1

PROJECT 2.2 STATIONS

J - Initial gamma vs. time.
R - Residual gamma vs. time.
Rp- Portable residual gamma vs. time.
T - Thermal detector.
C - CASTLE station number.

STATION	ISLAND	CHEROKEE	ZUNI	APACHE, FLATHEAD HURON, NAVAJO
221.01	ABLE	JR		R
221.02	CHARLIE	JR		R
221.03	DOG	R		JR
221.04	EASY	R		JR
221.05	FOX	R		JR
221.06	GEORGE	R		JR
222.01	DOG Bunker			J
222.02	GEORGE Bunker			J
C220.01	UNCLE	R	R	R
220.08	OBOE		JR	
220.09	ROGER		JR	
220.14	PETER		JR	
C221.01	WILLIAM	R	R	
C221.02	YOKE	R	R	R
C221.04	ALFA	R	R	R
C210.72	HOW	Rp	Rp	Rp
C210.73	LOVE	Rp	Rp	Rp
	NAN	Rp,T		Rp,T*
	YAG 39	R	R	R#
	YAG 40	R	R	R#
	LST 611	R	R	R#

*NAVAJO and APACHE
#FLATHEAD and NAVAJO

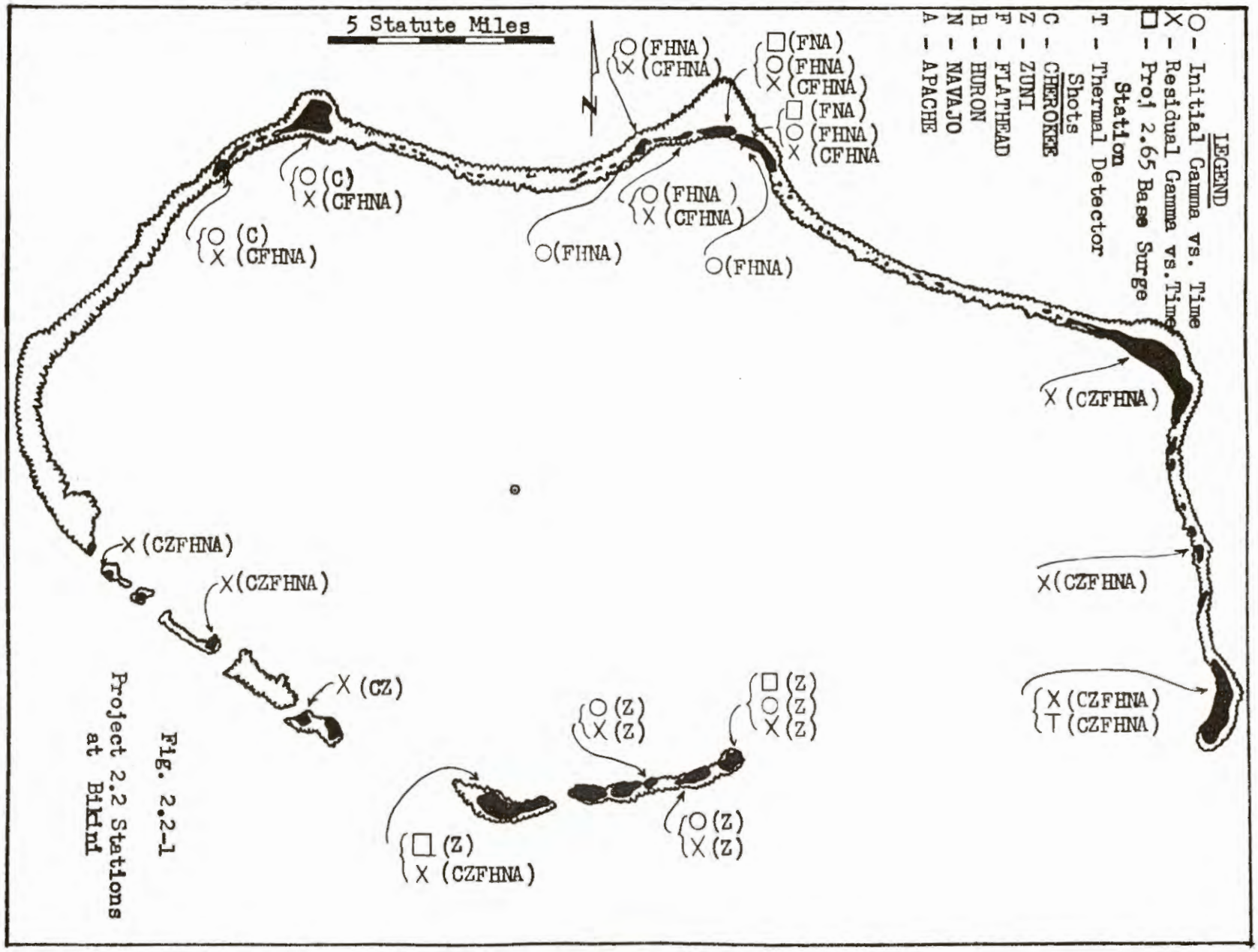

Fig. 2.2-1
Project 2.2 Stations at Bikini

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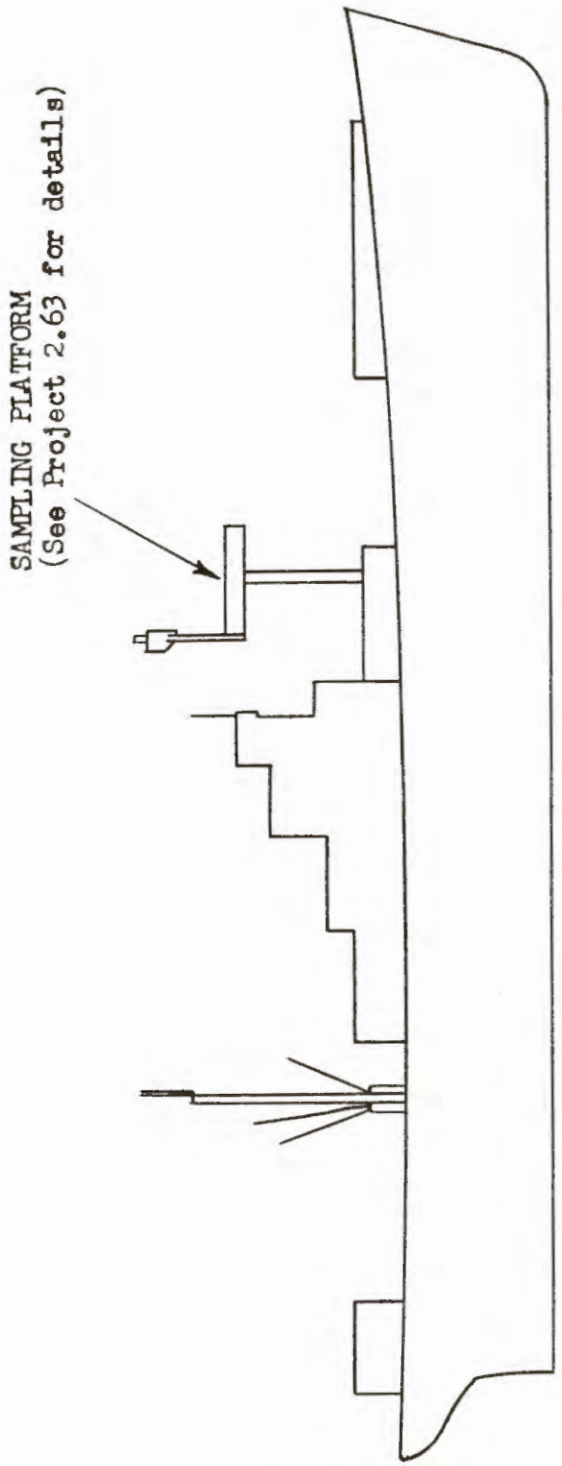

Fig. 2.2-2

Project 2.2 - Gamma Detector on Sampling Platform on YAGs 39 and 40

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SECTION II

PROJECT DETAIL

PROJECT - 2.4 TITLE: Decontamination and Protection

AGENCY: ACC/CWL

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO

= =

Objectives:

1. To study the contamination of various types of building surfaces exposed at various orientations to the fall-out.

2. To study the effectiveness of various decontamination procedures and thus obtain data on the radiological recovery of military installations constructed from the materials.

Description and Experimental Procedures:

1. Panels of various materials, including tent materials, temporary and permanent building materials, will be mounted on a structure so as to present various orientations to the fall-out. Such assemblies will be mounted on the forward portion of YAG-40 and YAG-39 for exposure in the expected fall-out zone and will thus be contaminated by the fall-out. At H+12 hours the personnel aboard ship will affix canvas covers over the panels to minimize subsequent wind and water action.

2. As soon as the YAG's return to base at ELMER, the assemblies will be transferred to the project decontamination area at ELMER and the panels removed. The contamination will be subjected to a radiological survey and then decontaminated by repeated hosing and scrubbing operations with cleaning solutions. The effectiveness of the decontamination procedures will be determined by radiological surveys. Contaminant properties will be determined by conducting some radiochemical and radiophysical investigations of the surface contamination and decontamination wastes.

Station Locations:

The panel assembly, Fig. 2.4-1, will be mounted on the forward portion of the YAG's as shown on Fig. 2.4-2. The layout of the decontamination area on ELMER is indicated on Fig. 2.4-3. The nature and the location of the panels is indicated on Table 2.4-1.

TABLE 2.4-1

PANELS

Panel Surface	Frame Location	Slope	Surface Finish
Asbestos Cement Shingles	Front Side	Vertical	Control
			Asbestos Cement Paint
	Port Side	Vertical	Asbestos Cement Paint
	Starboard Side	Vertical	Asbestos Cement Paint
Wood Siding (Clapboard)	Front Side	Vertical	Control
			Lead and Oil Paint
			Multiple Pigment Paint
			Epon Resin Paint
	Port Side	Vertical	Control
			Lead and Oil Paint
			Multiple Pigment Paint
			Epon Resin Paint
	Starboard Side	Vertical	Control
			Lead and Oil Paint
			Multiple Pigment Paint
			Epon Resin Paint
Sheet Metal	Front Side	Vertical	Alkyd Resin Paint
			Epon Resin Paint
	Port Side	Vertical	Alkyd Resin Paint
	Starboard Side	Vertical	Alkyd Resin Paint
Brick (medium density)	Front Side	Vertical	Control
			Resin Emulsion Paint
	Port Side	Vertical	Control
	Starboard Side	Vertical	Control
Concrete Block	Front Side	Vertical	Control
			Resin Emulsion Paint
	Port Side	Vertical	Resin Emulsion Paint
	Starboard Side	Vertical	Resin Emulsion Paint
Poured Concrete (smooth finish)	Front Side	Vertical	Control
			Cement Water Paint
	Port Side	Vertical	Control
	Starboard Side	Vertical	Control

TABLE 2.4-1 (Cont'd)

PANELS

Panel Surface	Frame Location	Slope	Surface Finish
Stucco (Coarse finish)	Front Side	Vertical	Masonry Paint
	Port Side	Vertical	Masonry Paint
	Starboard Side	Vertical	Masonry Paint
Special Phenolic	Front Side	Vertical	Phenolin Overlay Board and Phenolic Plywood
Concrete Pavement	Top-Front Slope	Horizontal	Control
	Top-Back Slope	Horizontal	Control
Asphalt and Gravel Built-up Roofing	Top-Front Slope	Horizontal	Control
			Polyvinyl Alcohol
	Top-Back Slope	Horizontal	Control
			Polyvinyl Alcohol
Roll Roofing (smooth surface)	Top-Front Slope	3"/ft	Control
			Polyvinyl Alcohol
	Top-Back Slope	3"/ft	Control
			Polyvinyl Alcohol
Corrugated Metal Roofing	Top-Front Slope	3"/ft	Control
			Asphalt Protected
	Top-Back Slope	3"/ft	Control
			Asphalt Protected
Strip Shingle Roofing (mineral surface)	Top-Front Slope	6"/ft	Control
	Top-Back Slope	6"/ft	Control

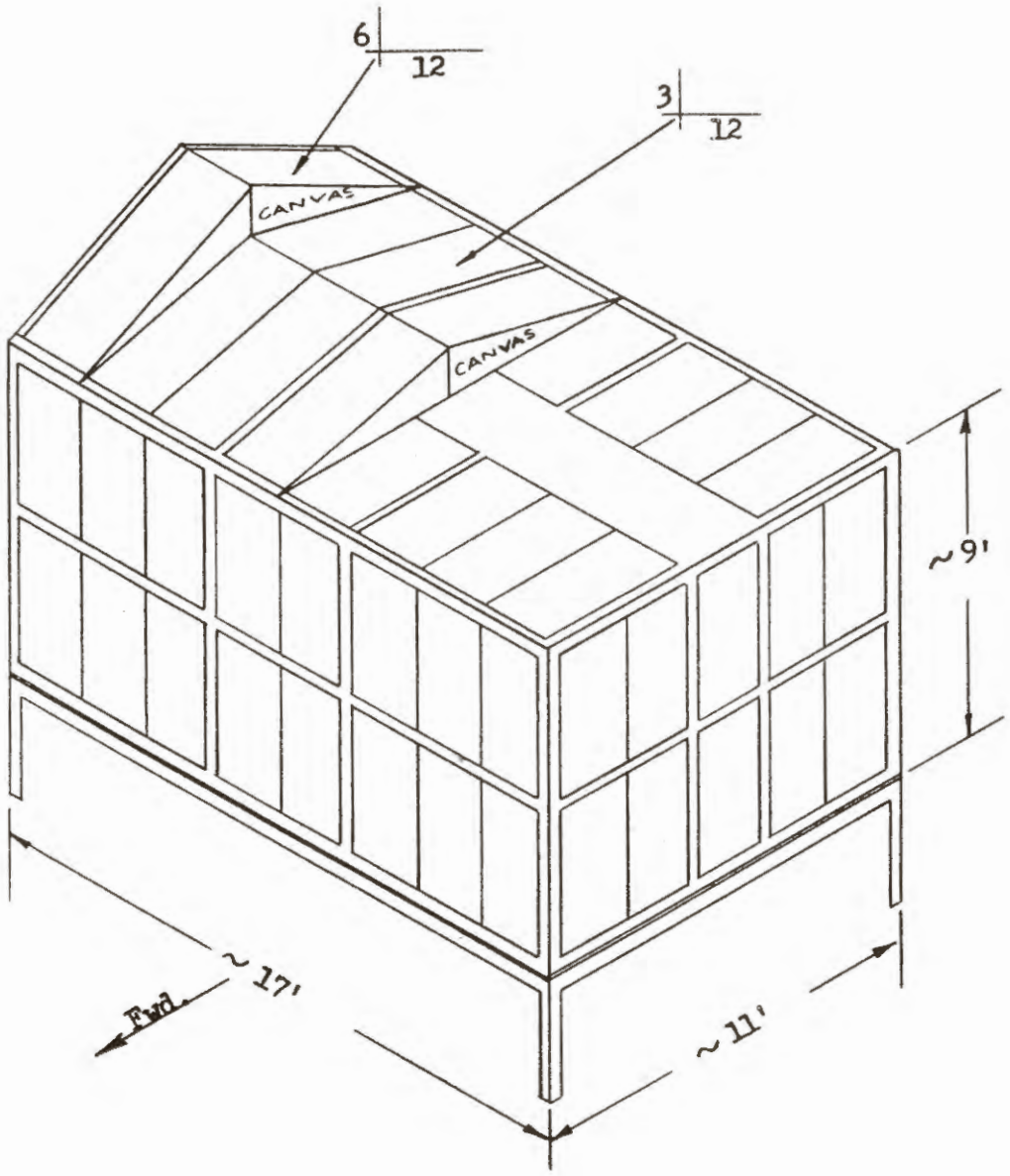

Fig. 2.4-1

Panel Assembly

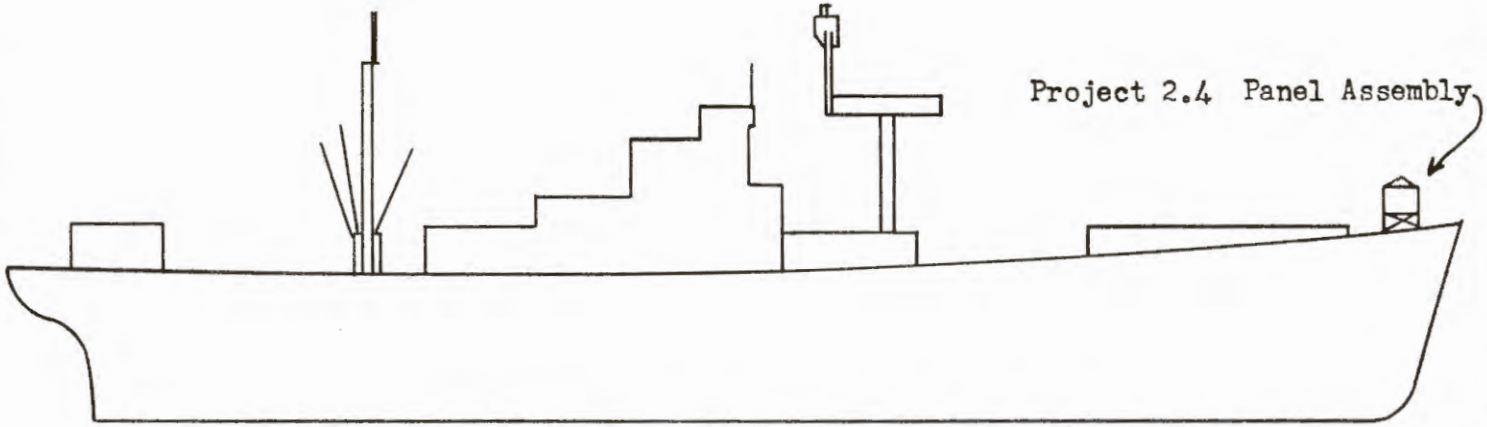

Fig. 2.4-2

Panel Assembly Location on YAG's

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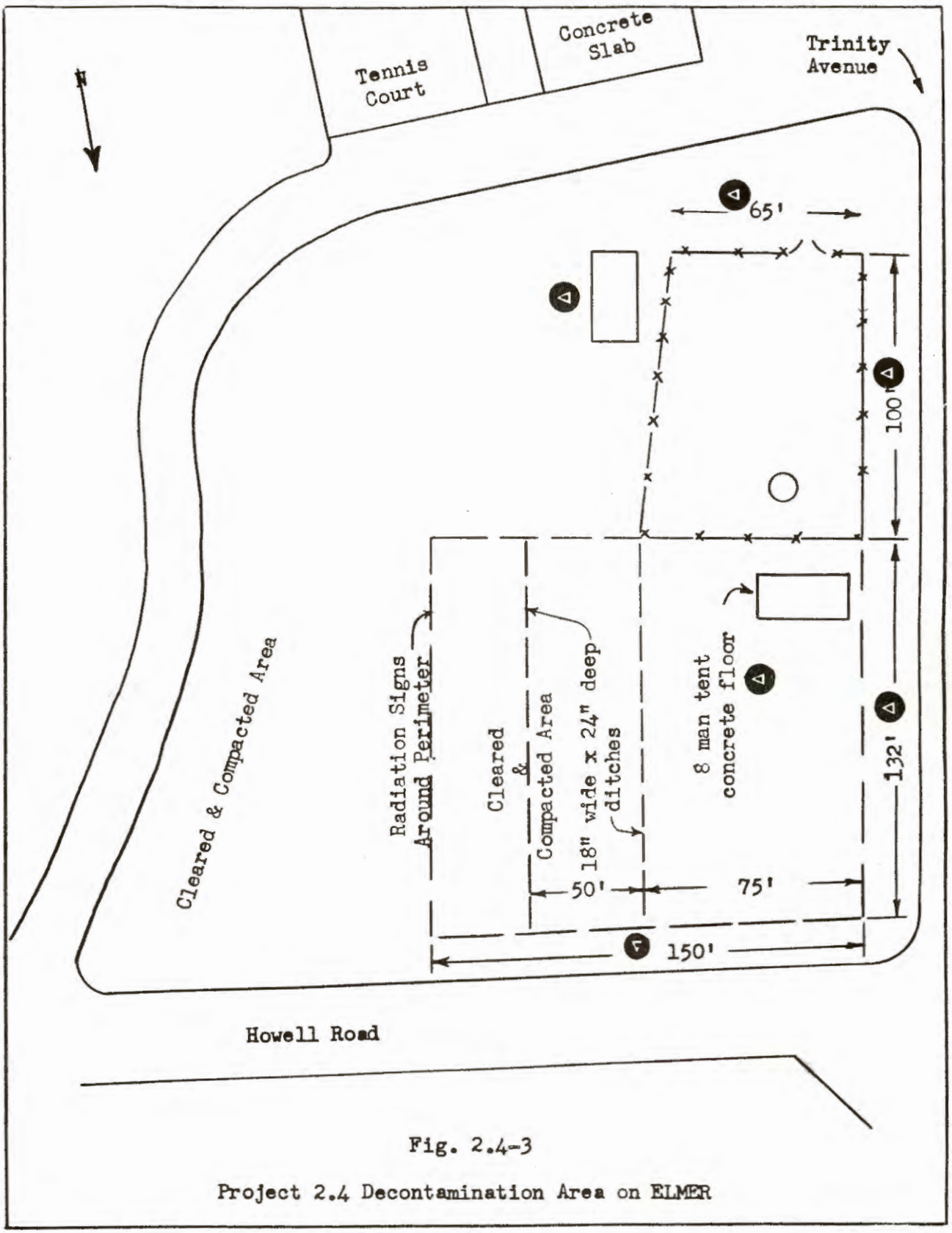

Fig. 2.4-3

Project 2.4 Decontamination Area on ELMER

SECTION II

PROJECT DETAIL

PROJECT - 2.51 TITLE: Neutron Flux Measurements

AGENCY: ACC/CWL

PARTICIPATION: CHEROKEE, YUMA, BLACKFOOT, KICKAPOO

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Objectives:

1. To measure the neutron flux and energy spectrum as a function of distance from nuclear detonations of various sizes. Also to evaluate the angular distribution.

2. To test the shielding effectiveness of concrete with quantities of Borax and/or Sulfur added.

3. To compare the threshold detector method of determining dose in rep with chemical and semi-conductor dosimeter methods.

4. To compare the data obtained with results from previous operations.

Description and Experimental Procedures:

1. Activation and fission threshold neutron detectors will be placed in field containers which will be designed to withstand over-pressures up to 100 psi. The following detectors will be used:

DETECTOR	TYPE	MINIMUM ENERGY
Gold	Activation	Thermal
Tantalum	Activation	Thermal (high intensities)
Sulfur	Activation	2.5 - 3.0 Mev
$Plutonium^{239}$	Fission	200ev - 400ev dependent on amount of B^{10} shielding
$Neptunium^{237}$	Fission	750 Kev
$Uranium^{238}$	Fission	1.5 Mev

The detectors will be emplaced before the detonation and recovered as soon as radiological conditions permit. They will be transported to the counting vans located at ELMER Island. Early recovery is especially important for the fission detector foils since their activity decays rapidly enough that they will not be useful after H/24. Initial counting should start no later than H/10 hrs.

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2. During the BLACKFOOT shot, six concrete boxes measuring 3 ft x 3 ft x 3ft, will be instrumented with neutron detectors and placed on an arc at a distance of 750 ft from ground zero. Included in the concrete will be various quantities of Borax and Sulfur.

3. Germanium single crystal fast neutron dosimeters and chloroform-phase dosimeters will be placed in a field container at the same locations that the activation and fission neutron detectors are placed. These dosimeters will be furnished by the AEC Experimental Instruments Division and the USAF School of Aviation Medicine. The dosimeters will be recovered at the same time that the activation and fission detectors are recovered. All dosimeter measurements will be made by the owner agencies who will in turn furnish the data to this project for inclusion in the project report.

Station Locations:

1. The neutron detector stations for the CHEROKEE shot are indicated on Fig. 2.51-1. Each station will be instrumented with one each Au, Ta, Zr, S, and two sets of 3 fission detectors. In addition one germanium and chloroform-phase dosimeter packet will be placed at each station.

2. The BLACKFOOT stations are indicated on Fig. 2.51-2. Each station along the instrument line will be instrumented with one Au and/or Ta, one S and 2 sets of three fission detectors. One germanium and chloroform-phase dosimeter packet will be placed at each station. The concrete boxes will be instrumented both inside and out with one Au detector, one S detector, and one dosimeter packet.

3. The station layouts for the KICKAPOO and YUMA shots are indicated on Fig. 2.51-3. Each station will include one Au and/or Ta foil, one S sample, one set of 3 fission detectors, and one dosimeter packet.

4. All station locations are tabulated in Table 2.51-1.

TABLE 2.51-1

PROJECT 2.51 NEUTRON DETECTOR STATIONS

STATION NO.	ISLAND	DISTANCE FROM GZ (ft)	AZIMUTH	DETECTORS
CHEROKEE				
250.01	CHARLIE	80	269°	Au, Ta, Zr, S, 2 sets of fission detectors, ChPh and Ge dosimeters.
250.02	do	1,250	269°	do
250.03	do	2,500	269°	do
251.01	CHARLIE Reef	2,500	89°	do
BLACKFOOT				
252.01	YVONNE Reef	348.7	337°28'33"	Au and/or Ta, S, 2 sets of 3 fission detectors, ChPh and Ge dosimeters.
252.02	do	445.2	do	do
252.03	do	627.7	do	do
252.04	do	941.5	do	do
252.05	do	1,295.0	do	do
252.06	do	1,626.9	do	do
252.07	do	1,957.3	do	do
252.08	do	2,287.0	do	do
252.09	do	2,616.1	do	do
252.10	do	2,945.2	do	do
252.11	do	3,274.1	do	do
255.01	YVONNE	750	315°	Array of 6 concrete boxes with Au, S detectors, ChPh and Ge dosimeters inside and out.
KICKAPOO				
253.42	SALLY	300	151° 15'	Au and/or Ta, S, 1 set of 3 fission detectors, ChPh and Ge dosimeters.
253.43	do	600	do	do
253.44	do	900	do	do
253.45	do	1,200	do	do
253.46	do	1,500	do	do
253.47	TILDA	1,800	do	do
253.48	do	2,100	do	do
253.49	do	2,400	do	do
253.50	do	2,700	do	do
253.51	do	3,000	do	do

TABLE 2.51-1 (Cont'd)

STATION NO.	ISLAND	DISTANCE FROM GZ (ft)	AZIMUTH	DETECTORS
KICKAPOO (Cont'd)				
253.32	SALLY	300	210°	Au and/or Ta, S, 1 set of 3 fission detectors, ChPh and Ge dosimeters.
253.33	do	600	200°	do
253.34	do	900	196° 45'	do
253.35	do	1,200	do	do
253.36	do	1,500	do	do
253.37	do	1,800	do	do
253.38	do	2,100	do	do
253.39	do	2,400	do	do
253.40	do	2,700	do	do
253.22	do	300	227° 15'	do
253.23	do	600	do	do
253.24	do	900	do	do
253.25	do	1,200	do	do
253.26	do	1,500	do	do
253.27	do	1,800	do	do
253.28	do	2,100	do	do
253.29	do	2,400	do	do
YUMA				
253.15	do	300	47° 15'	do
253.16	do	600	do	do
253.17	do	900	do	do
253.18	do	1,200	do	do
253.19	do	1,500	do	do
253.20	do	1,800	do	do
253.21	do	2,100	do	do
253.01	do	300	67°	do
253.02	do	600	do	do
253.03	do	900	do	do
253.04	do	1,200	do	do
253.05	do	1,500	do	do
253.06	do	1,800	do	do
253.08	do	300	110° 45'	do
253.09	do	600	do	do
253.10	do	900	do	do
253.11	do	1,200	do	do
253.12	do	1,500	do	do
253.13	do	1,800	do	do

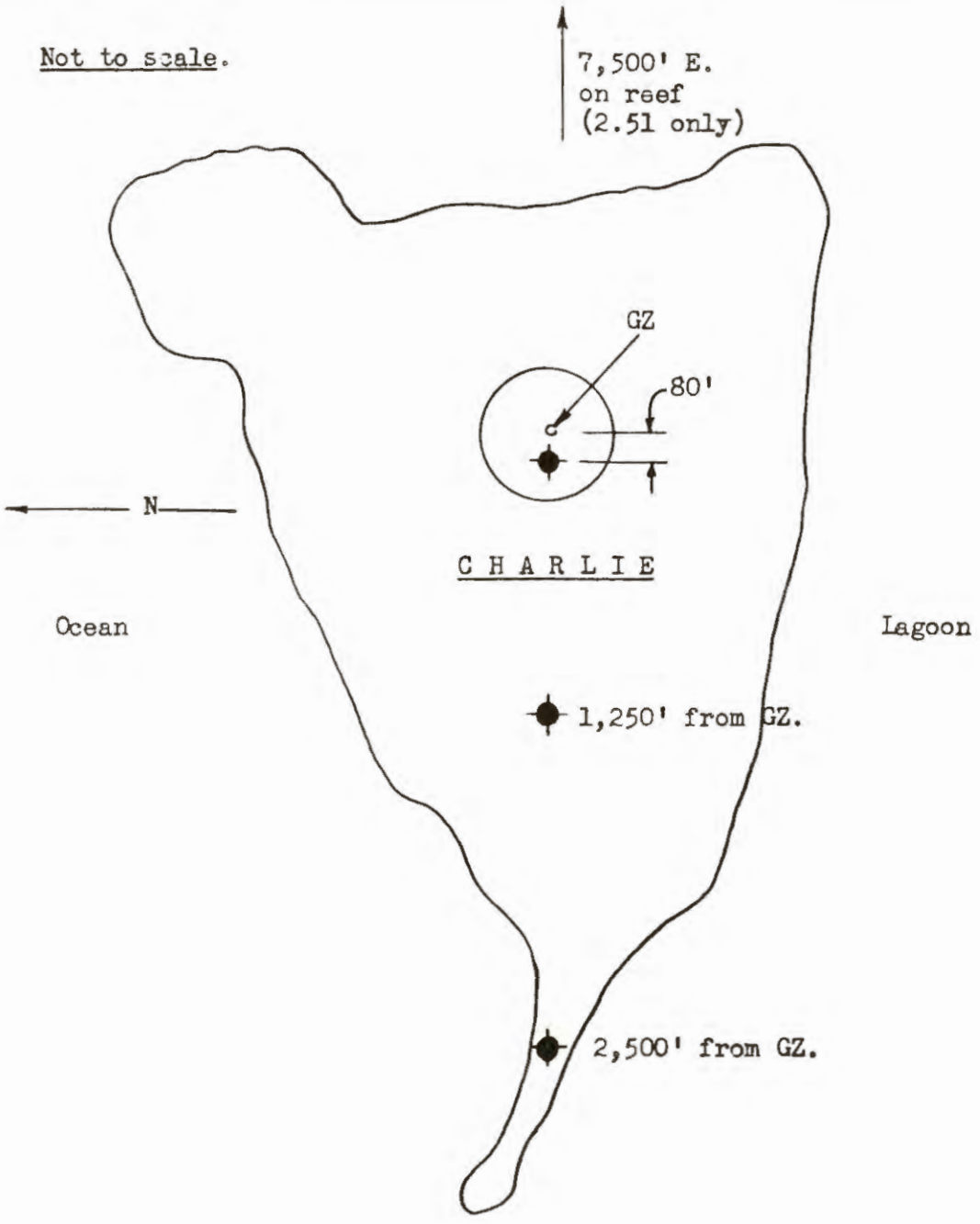

Fig. 2.51-1

Neutron Stations for CHEROKEE.

Projects 2.51 and 2.52

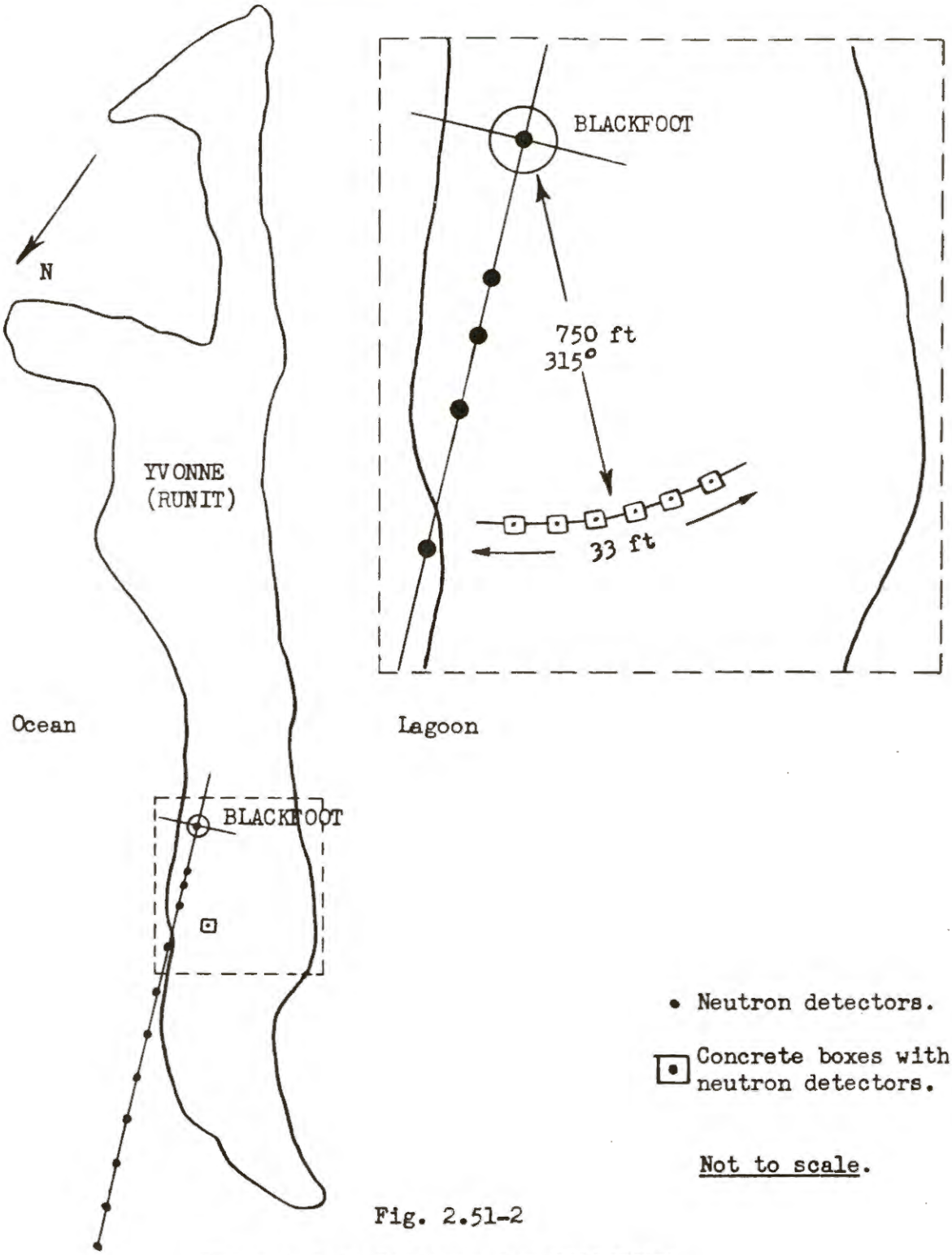

Fig. 2.51-2

Project 2.51 Stations for BLACKFOOT

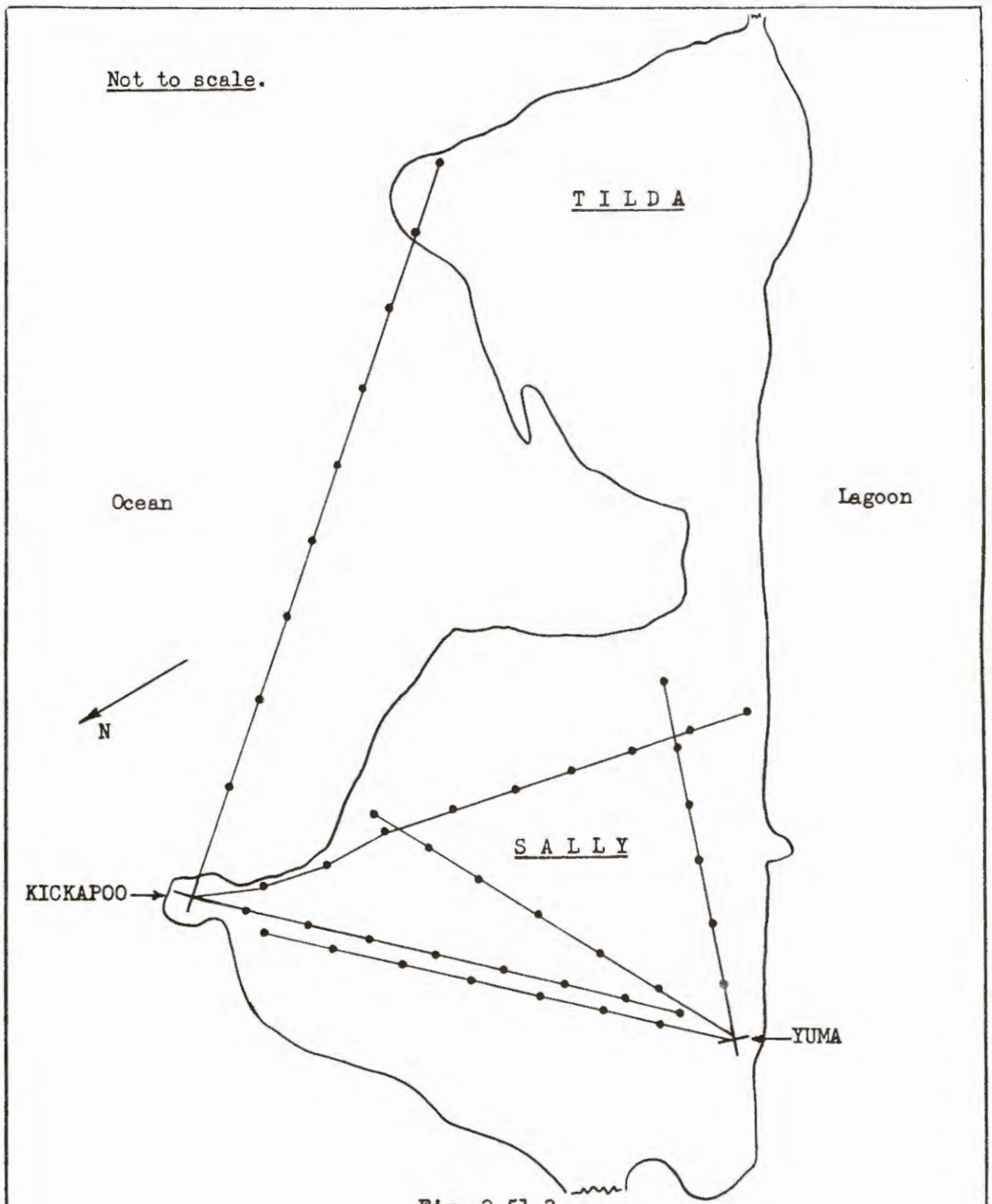

Fig. 2.51-3

Layout of Project 2.51 Stations

SECTION II

PROJECT DETAIL

PROJECT - 2.52

TITLE: Neutron Induced Soil Radioactivity

AGENCY: SC

PARTICIPATION: CHEROKEE

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Objectives:

To determine experimentally the radioactivity in various typical soil samples induced by irradiation in a thermonuclear detonation. The interpretation will aim at predicting soil radioactivity for a nuclear explosion at any location.

Description and Experimental Procedures:

The soil samples to be irradiated are as follows:

TYPE OF SOIL	LOCATION OBTAINED FROM
Conowingo silt loam	Maryland
Nipe clay	Puerto Rico
Forest clay	Hawaii
Norfolk fine sandy loam	South Carolina
Carrington loam	Iowa
Chester loam	Virginia
Houston black clay	Texas
Test site soil	Nevada
Spring clay loam	Las Vegas, Nevada
Niland gravely fine sand	California
Coral sand	Bikini Atoll

The samples are to be enclosed in a steel pipe, 3 in. I.D., 1/4 in. wall, and about 20 in. long. They will be placed at the three Project 2.51 land stations for the CHEROKEE shot. The samples will be recovered together with the Project 2.51 samples and immediately sent to the project counting lab in Shelter 102 on OBOE. The soils will be analyzed by a gamma spectrometer for intensity vs energy and time. The interpretation will evaluate quantitatively the activity induced in the various elements in the soil by combining the data with a chemical analysis. Comparison of this data with that taken at Operation TEAPOT will check on the difference, if any, between the irradiation by fission and fission-fusion weapons. Figure 2.52-1 is a drawing of the sample container.

Station Locations:

The CHEROKEE shot land stations for Project 2.51 will be shared by this project, and are located as in Fig. 2.51-1, and Table 2.51-1.

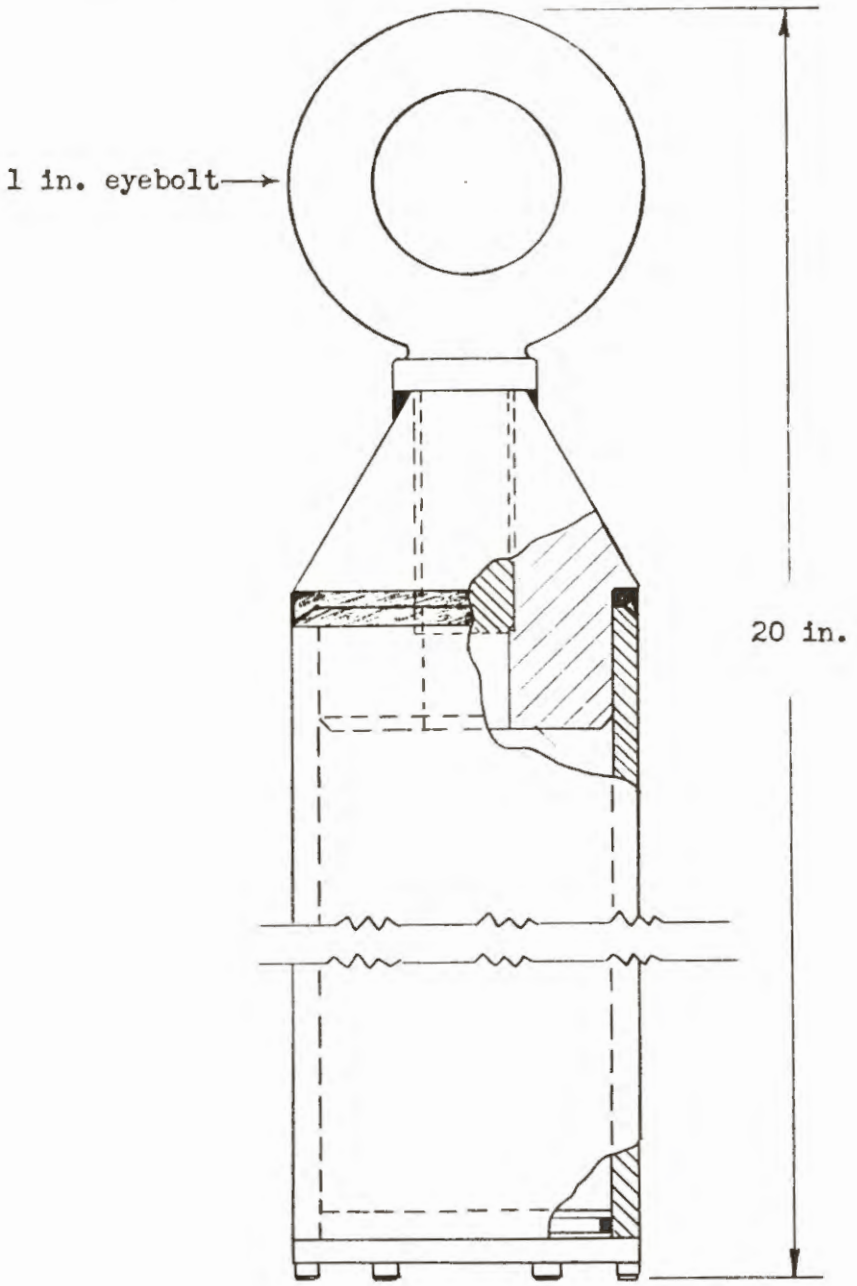

Fig. 2.52-1

Project 2.52 Soil Sample Container.

SECTION II

PROJECT DETAIL

PROJECT 2.61 TITLE: Rocket Determination of the Activity Distribution within the Stabilized Cloud

AGENCY: NRDL
(Horning-Cooper, Inc. under development contract with BUSHIPS for ASP missile)

PARTICIPATION: CHEROKEE, ZUNI, NAVAJO
Possibly FLATHEAD, HURON, and TEWA (Depending on CHEROKEE results)

Objectives:

To determine the spatial distribution of radioactivity in the cloud The following special information will be emphasized:

a. Relative activity distribution between stem and cloud.

b. Rate of change of activity at early times.

c. Performance of atmospheric sounding vehicles (ASP) up to high altitudes in an atomic cloud, and particularly whether information can be telemetered out of the radioactive cloud. Also information for use in further development of this type of data collection.

Description and Experimental Procedure:

1. The radioactivity in the cloud will be detected by pressure ion chambers borne by rocket propelled atmospheric sounding vehicles, also known as ASP (atmospheric sounding projectile). The data will be telemetered back to essentially duplicate receiving-recording stations on NAN Island and aboard the USS KNUDSON (APD-101).

2. The ASP is a 6½ in. diameter, 147½ in. long, fin stabilized, rocket propelled vehicle. The propellant consists of a single grain GCA201A stabilized ammonium perchlorate oxidizer and LP 33 Thiokol base. The single stage motor has a total impulse of 31,000 pound-seconds and a burning time of 5.8 sec. The pre-launch weight is 245 pounds with a burn-out weight of 100 pounds. The principle parts are shown on Fig. 2.61-1. The missile is launched from a rail-type, zero tip-off launcher capable of adjustment in the elevation angle. Preliminary test firings performed at the Naval Air Missile Test Center at Pt. Mugu, California and at the White Sands Proving Grounds, New Mexico have indicated the performance of the rockets to be as

indicated on Fig. 2.61-3. When the data from these firings are completely reduced, the knowledge of the trajectories will be used to calculate the position of the rockets in the cloud as a function of time for the predetermined elevation and azimuth of the launcher.

3. A block diagram of the firing circuits is indicated on Fig. 2.61-2. When the Blue Box, or hard wire timing signal, energizes the firing circuit, the launching signal transmitter commences to transmit one second timing signals and a camera commences to photograph the indicator lights on the circuits. Four min later, signals energize the telemeter transmitters of Salvo "A" and detonate the explosive bolts which hold down the rockets of that salvo. Beginning at 5 min the rockets of Salvo "A" are fired at one second intervals. Commencing at 14 min. the same procedure will activate and launch Salvo "B". The launching circuits are open at all times except during the 1 sec. firing pulse. At 24 min. the activating relay is opened to eliminate a recycling of the circuits and thus the possibility of the late firing of a rocket by a second signal if it has initially failed. As each rocket leaves the launcher, it opens a switch which changes the bias voltage on an oscillator and thus changes the transmitted frequency. Inspection of the launching signal record or the frequency meter readings can insure that all the rockets have moved on the launchers.

4. The rockets will be placed on launchers at HOW Island (147,710N, 170,770E) prior to the shot and will be aimed in accordance with the latest wind velocity predictions. The first salvo of six rockets will be fired at 5 min. after the detonation and the second salvo of six rockets at 15 min. (these times are subject to some adjustment). The launching is programmed by a local master timer which itself will be actuated by a Blue Box or wire timing signal. The maximum flight time will be about 3 min. The trajectories of the rockets will be calculated from the launcher orientation and vehicle performance and will be checked near the launcher by EG&G photography. Radar from the USS KNUDSON may also be employed although its usefulness may be limited by the extreme speed of the vehicles.

5. The shots basically being considered for Project 2.61 are CHEROKEE, ZUNI, and NAVAJO with the preliminary intent of firing two salvos of six rockets each, as shown in Figures 2.61-4,5, and 6. As better information on trajectories, telemeter performance, and cloud phenomenology develops, it may be desirable to extend the project into FLATHEAD, HURON and TEWA. In the case of FLATHEAD and HURON the possible trajectories are given in Figs. 2.61-7 and 8. TEWA trajectories will probably be identical to some of those for NAVAJO as shown in Fig. 2.61-6. The decision to participate on these additional shots will be made at the test site.

6. The data will be received at the duplicate receiving stations, be permanently recorded on magnetic tape at both stations, and also displayed for visual observation on board the USS KNUDSON.

Station Locations:

1. The launchers will all be located on HOW Island and will be unattended during the firings. The receivers are located in Room 29, Building 70, NAN Island, and aboard the USS KNUDSON, located about 35 miles from ground zero on a line at right angles to the rocket flight path. Two cameras for recording the initial trajectories will be located on NAN Island and four more on HOW Island.

2. The anticipated danger areas due to the rocket firings are indicated on Fig. 2.61-9. The areas are drawn large so as to be able to accommodate changes in the firing azimuth as required by wind predictions.

3. The distance from the launcher to ground zero is estimated to be as follows:

CHEROKEE	92,000 ft	105° 25' 12"
ZUNI	96,923 ft	51° 48' 47"
FLATHEAD	app. 56,000 ft	app. 106°
HURON	app. 56,000 ft	app. 106°
NAVAJO	55,753 ft	104° 31' 52"
TEWA	app. 56,000 ft	app. 106°

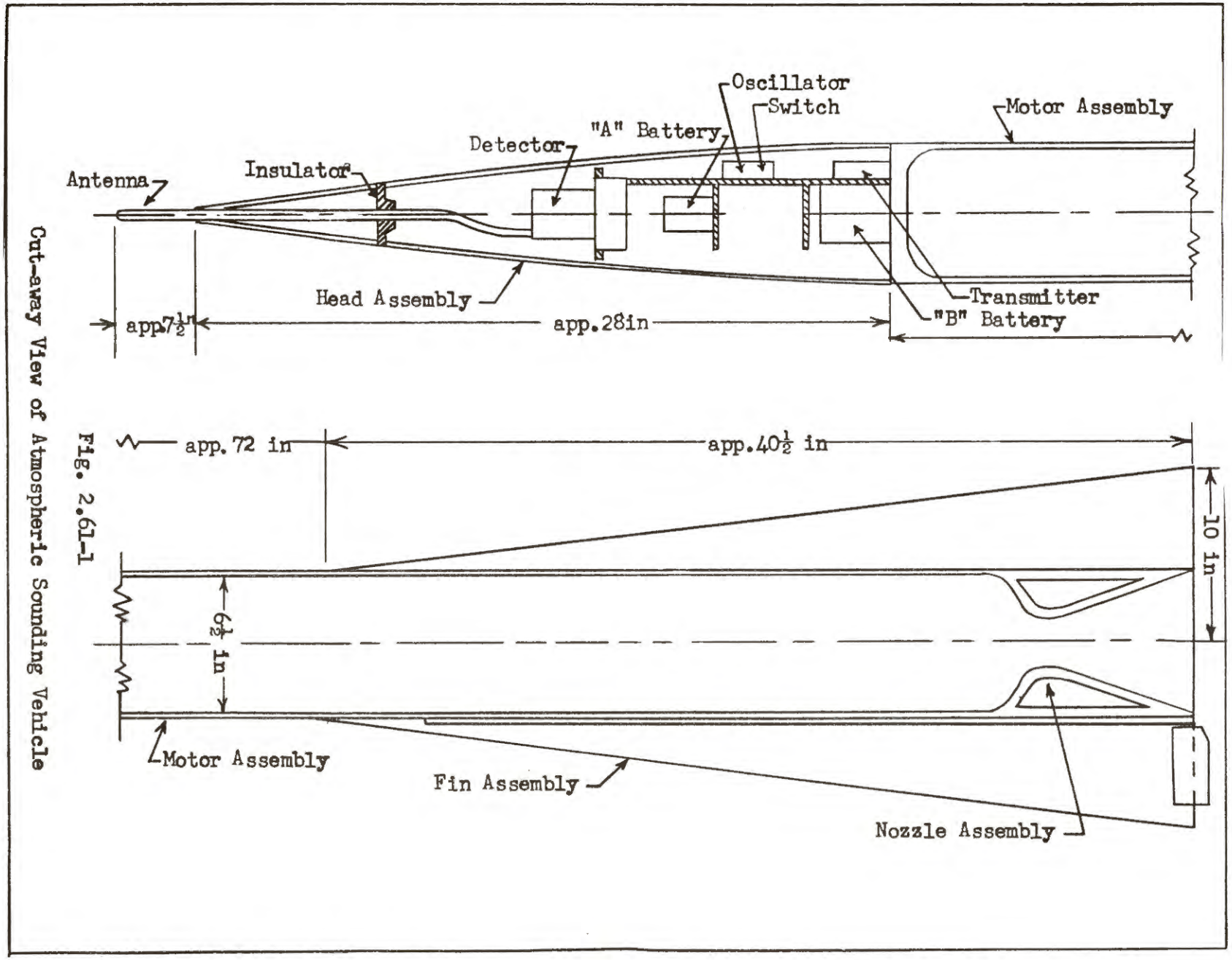

Fig. 2.61-1 Cut-away View of Atmospheric Sounding Vehicle

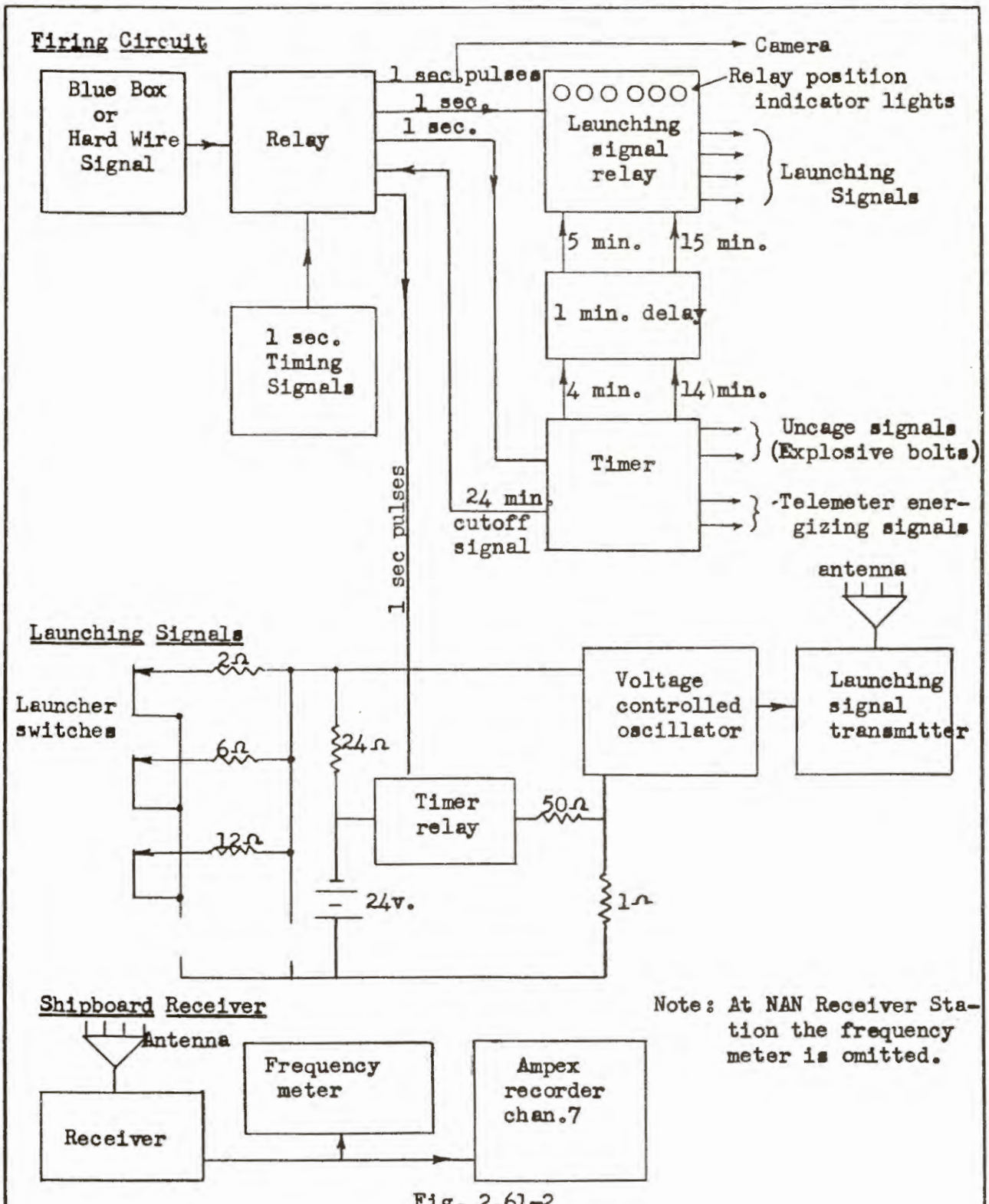

Fig. 2.61-2

Firing Circuits

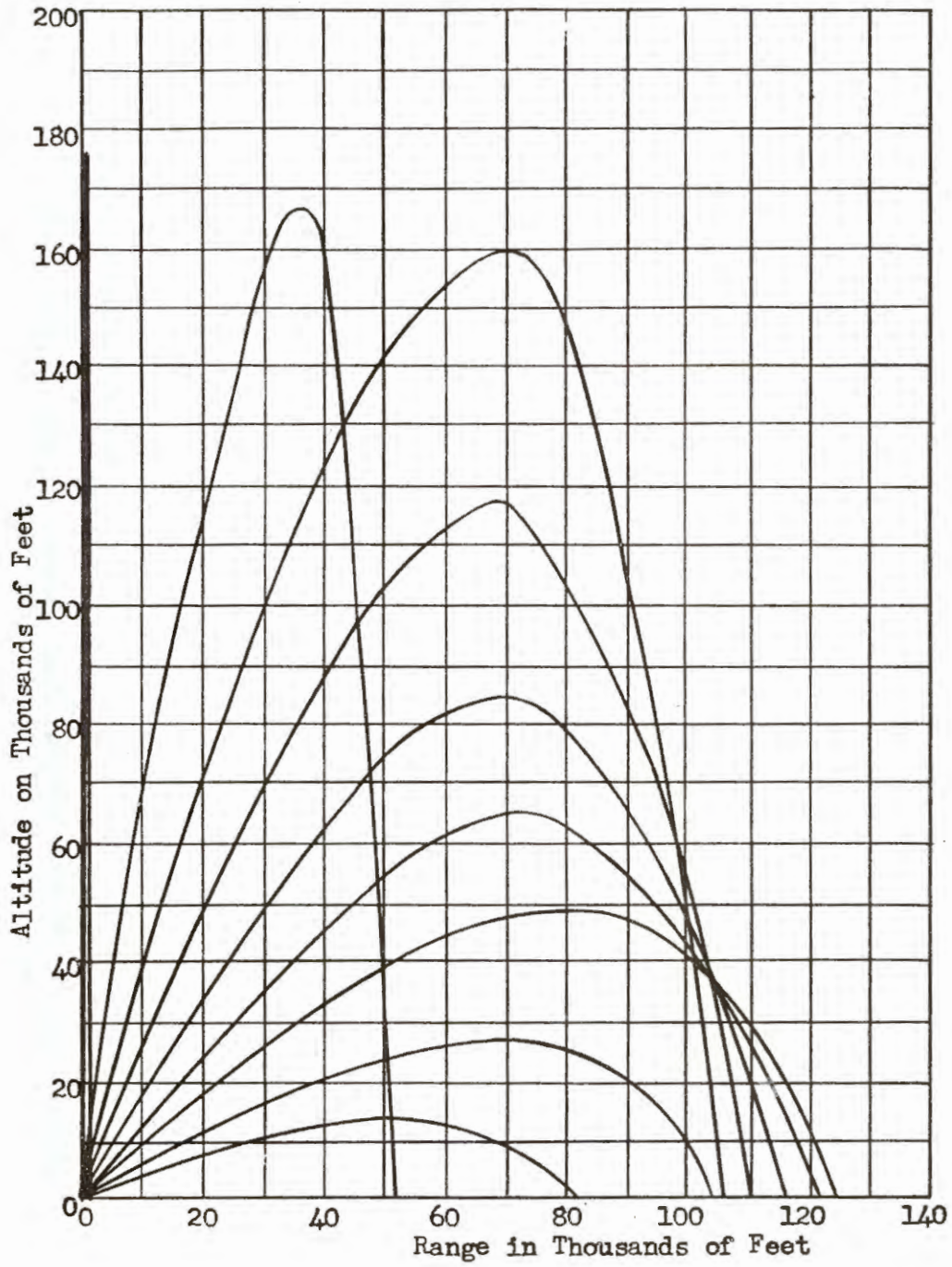

Fig. 2.61-3

Tentative Trajectories for ASP

Assumed Cloud Dimensions

	0 ∠ 8 min	0 ∠ 15 min
Cloud Height	90,000 ft	90,000 ft
Cloud Base	50,000 ft	50,000 ft
Cloud Diameter	215,000 ft	> 240,000 ft
Stem Diameter	20,000 ft	~ 20,000 ft

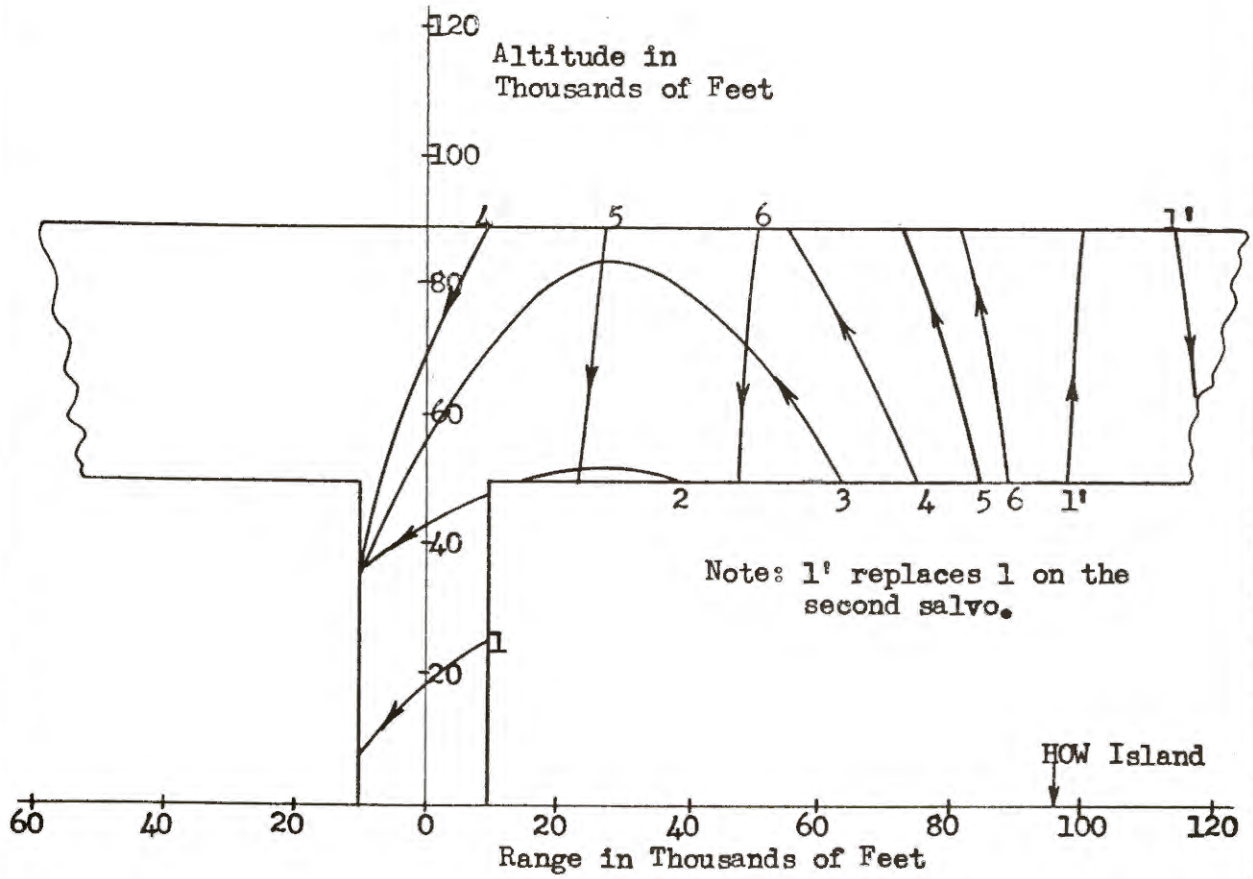

Fig. 2.61-4

Tentative Rocket Paths through CHEROKEE Cloud

Assumed Cloud Dimensions

	0 ∠ 8 min	0 ∠ 15 min
Cloud Height	70,000 ft	70,000 ft
Cloud Base	40,000 ft	40,000 ft
Cloud Diameter	115,000 ft	>150,000 ft
Stem Diameter	10,000 ft	~10,000 ft

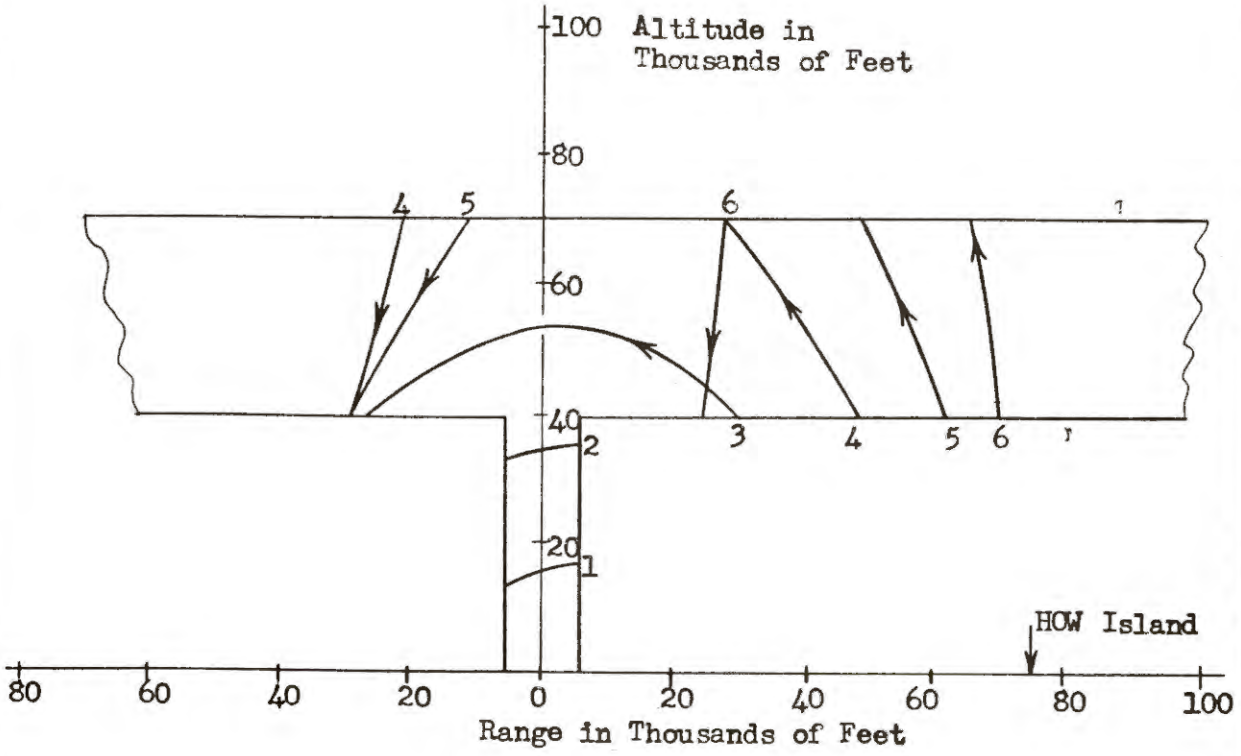

Fig. 2.61-5

Tentative Rocket Paths through ZUNI Cloud

Assumed Cloud Dimensions

	0 ∠ 8 min	0 ∠ 15 min
Cloud Height	90,000 ft	90,000 ft
Cloud Base	50,000 ft	50,000 ft
Cloud Diameter	215,000 ft	> 240,000 ft
	20,000 ft	~ 20,000 ft

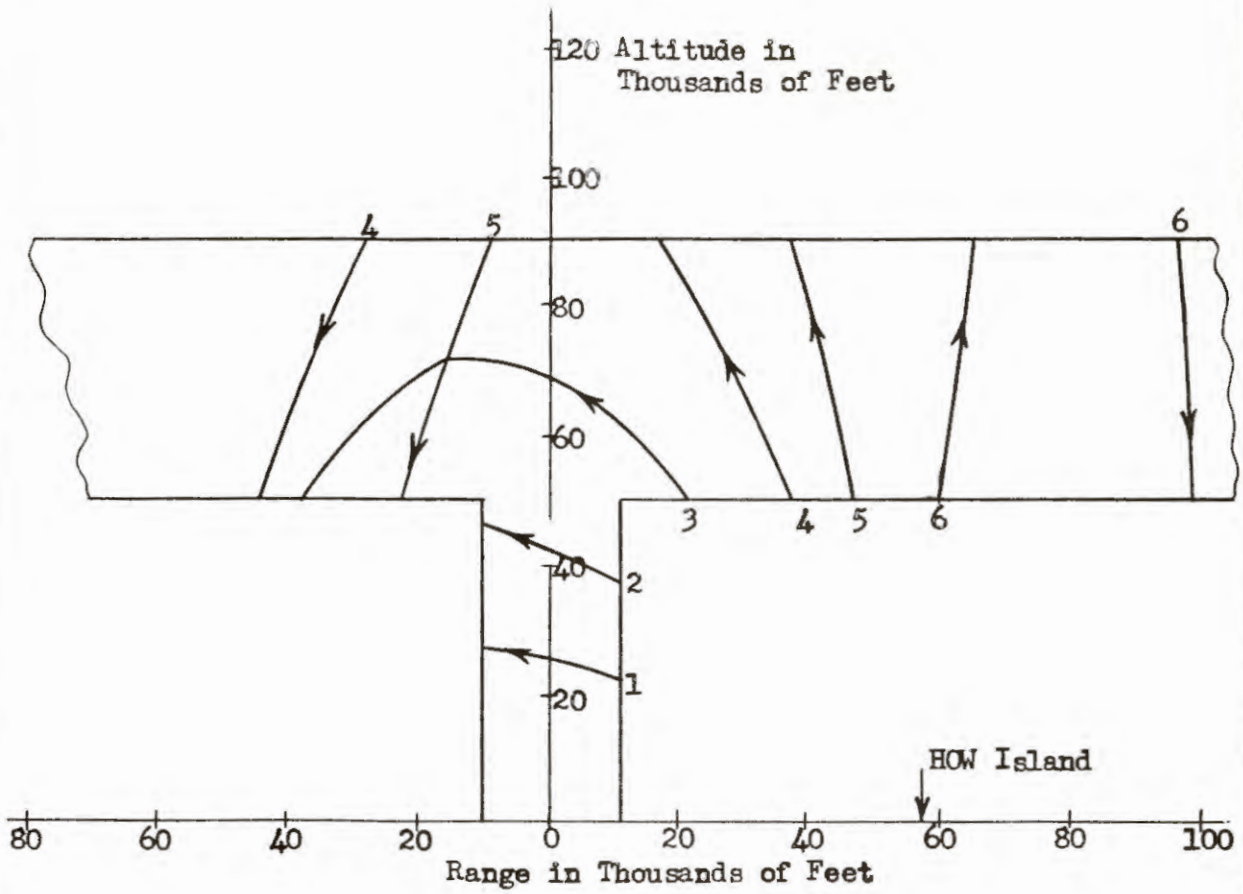

Fig. 2.61-6

Tentative Rocket Paths through NAVAJO Cloud
(Some paths may be used for TEWA)

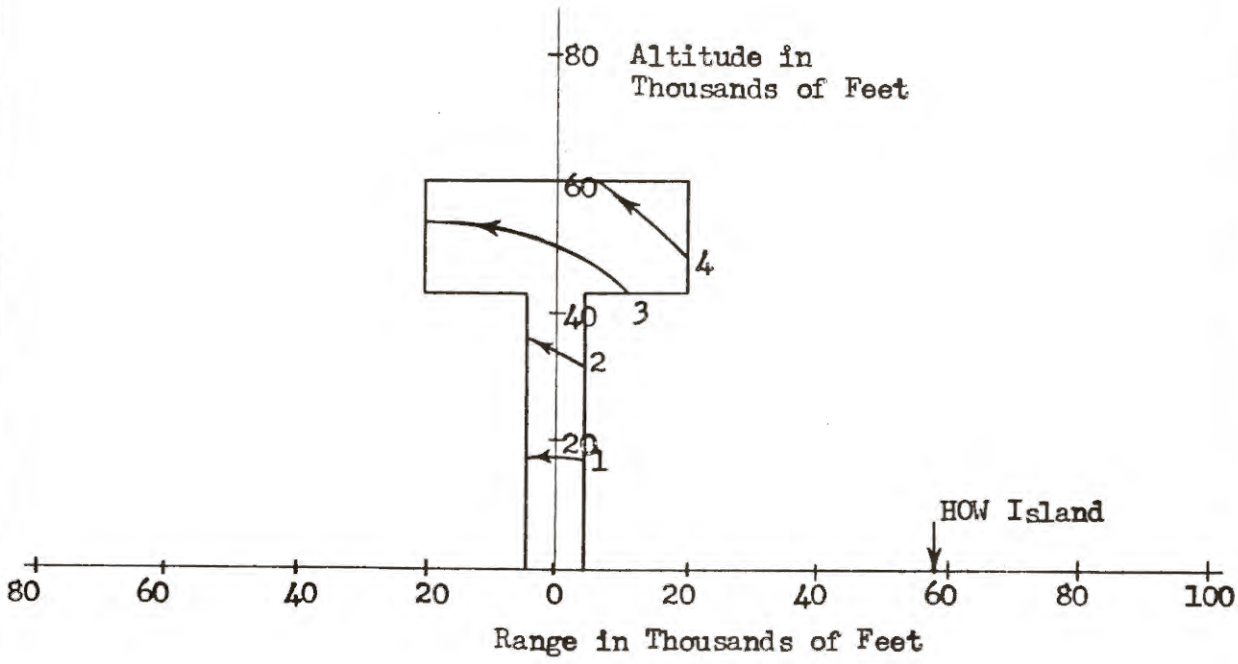

Fig. 2.61-7

Tentative Rocket Paths through FLATHEAD Cloud

(Participation to be determined after CHEROKEE shot)

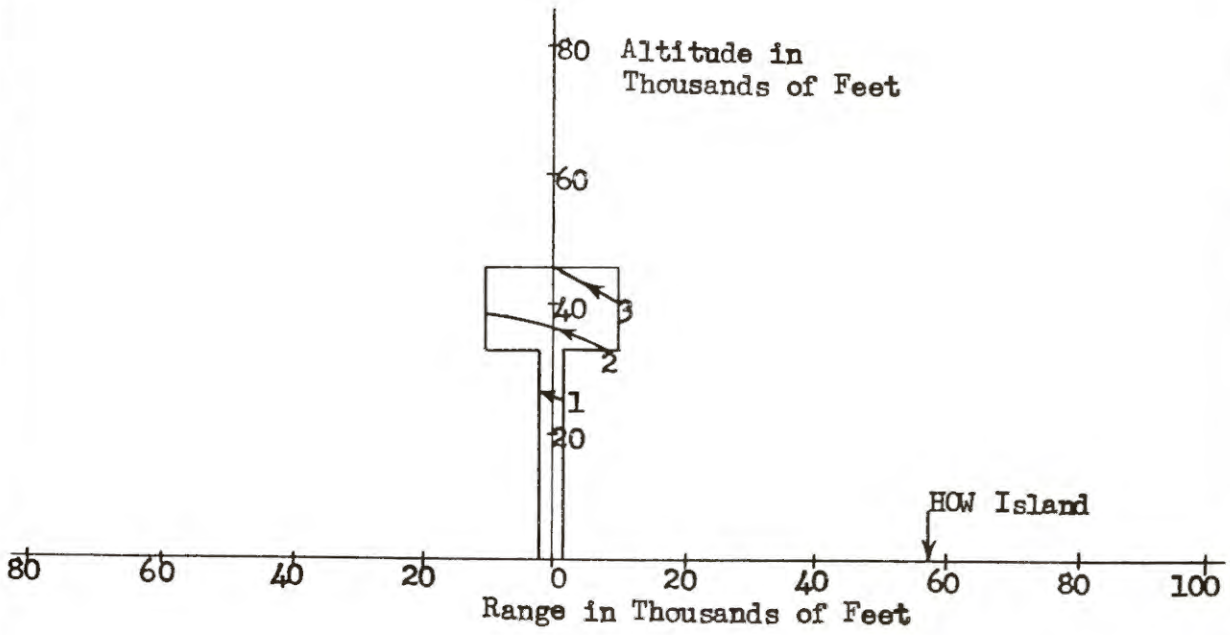

Fig. 2.61-8

Tentative Rocket Paths through HURON Cloud

(Participation to be determined after CHEROKEE shot)

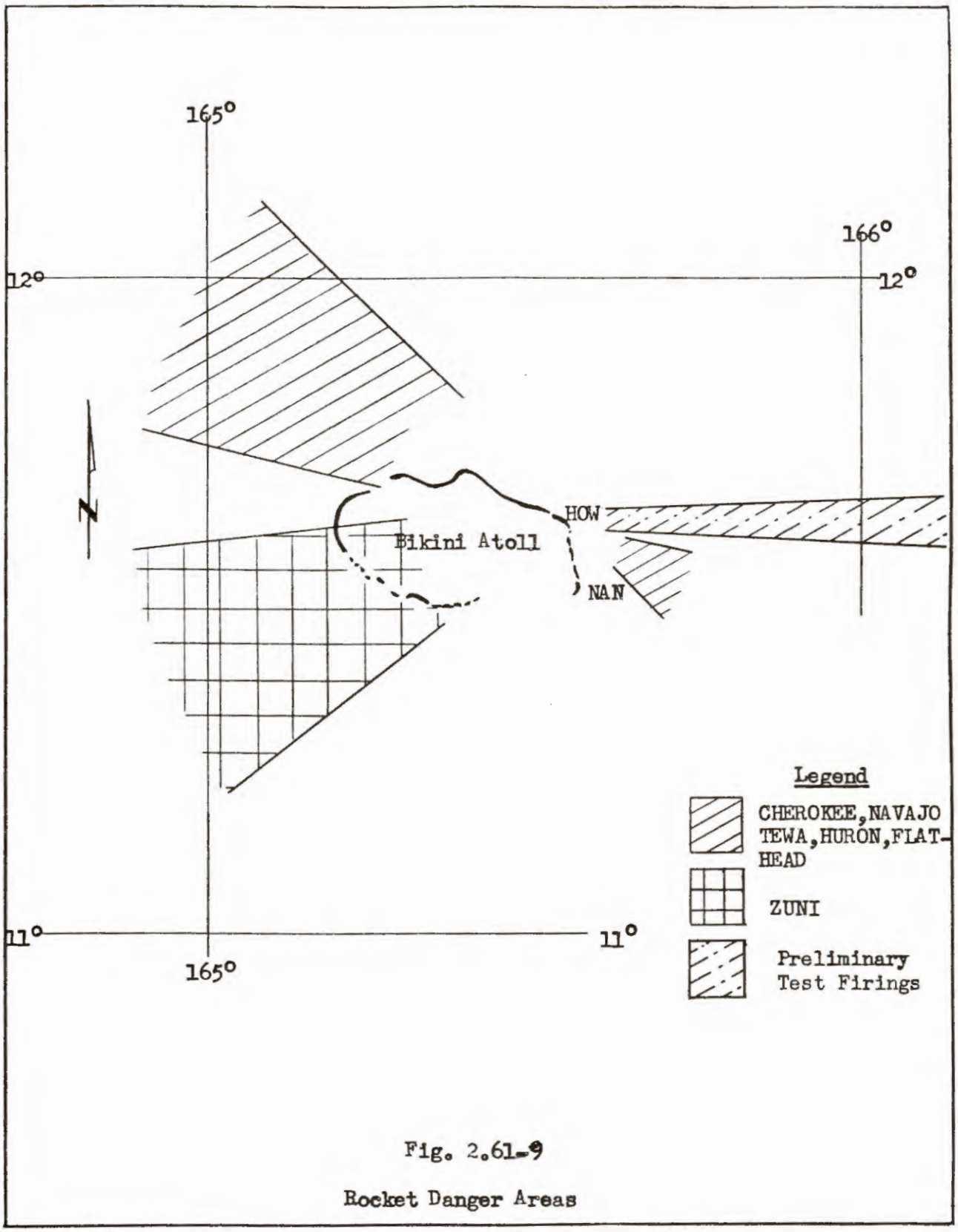

Fig. 2.61-9

Rocket Danger Areas

SECTION II

PROJECT DETAIL

PROJECT 2.62 TITLE: Fall-out Contours by Oceanographic Analysis

AGENCY: SIO under contract with ONR

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE, TEWA

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Objectives:

1. To understand the oceanography of the ocean area where fall-out is expected in order to extrapolate the observed fall-out pattern back to the equivalent land pattern. To furnish oceanographic assistance to the Task Force.

2. To measure the fall-out radioactivity and its chemical nature in the water from a high air burst, a surface land burst, and surface water bursts. To calculate the equivalent land fall-out pattern.

3. To understand the nature of the transport and dilution of radioactive fall-out material in the ocean to permit future surveys to acquire a complete fall-out picture from the least possible measurements.

4. To understand the oceanography of Bikini Lagoon as it involves the circulation of contaminated waters, particularly the effluent thereof and the occurrence of rapid transients of circulation which may result in sudden redistribution of activity.

Description and Experimental Procedure:

1. The SIO oceanographic vessel M/V HORIZON will arrive at the Bikini Area approximately 5 weeks previous to the first shot. During the pre-shot interval the SIO scientists will use the vessel to perform an oceanographic survey of the area in a radius of about 200 miles around Bikini. The following measurements will be performed:

a. Measurements of the current velocities by computations from distribution of water density, electromagnetic measurements, observations on drogues, and use of propellor type current meters.

b. Studies of vertical density structures and vertical motion.

c. Background radiation determinations on water samples at various depths.

d. Bottom coring and dredging in areas of fall-out from Operation CASTLE (Spring 1954).

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2. The Bikini Lagoon will be investigated using an instrumented trailer aboard a Navy LCU. The following points will be studied:

a. Circulation of water within the lagoon and effluent from it, using propellor type current meters, suspended bi-plane drag, and the tracking of drogues.

b. Measurements of characteristics of water such as temperature, salinity, oxygen content, and nutrient content.

c. Measurements on occasional conditions of rapid transient circulation in the lagoon and their relation to weather conditons.

d. Background determination from samples at various depths.

3. SIO will install and maintain sixteen deep-moored skiff stations (See Fig. 2.63-2) in the fall-out area between 10 and 30 miles from Ground Zero by use of the SIOUX (ATF-75). Recording instruments will be installed on these skiffs to measure the radioactivity as a function of time at depth intervals of 20 meters down to 100 meters. A time of arrival starting pulse will be supplied by Project 2.63.

4. Two high speed DE vessels, USS SILVERSTEIN (DE-534) and USS McGINTY (DE-365), will be outfitted with devices for measuring radioactivity as a function of depth and in the air, sample bottles, and drogue floats for marking areas of particular interest. These two vessels will be stationed outside the fall-out area during the shot and then proceed to survey the fall-out area making measurements out to about 250 miles from GZ. Approximately one hundred surface samples and a number of samples from depths will be taken for Project 2.63 on all shots.

5. The two Project 2.63 YAG's will also be supplied with detectors for radioactivity as a function of depth, and sampling bottles.

6. The research vessel M/V HORIZON will be completely equipped with radioactivity, oceanographic and sampling equipment. It will proceed into the fall-out area and perform its functions, particularly in the areas of interest marked by the DE's.

7. The LCU with equipment trailer aboard will be prepared to resurvey the Bikini Lagoon when radiological conditions permit.

Station Locations:

1. The location of project equipment on the YAG's is indicated on Fig. 2.62-1.

2. The location of the YAG's and the tentative early deployment of the M/V HORIZON is indicated on Fig. 2.62-2.

3. The tentative deployments of the two DE's are indicated on Figs. 2.62-3 and 2.62-4.

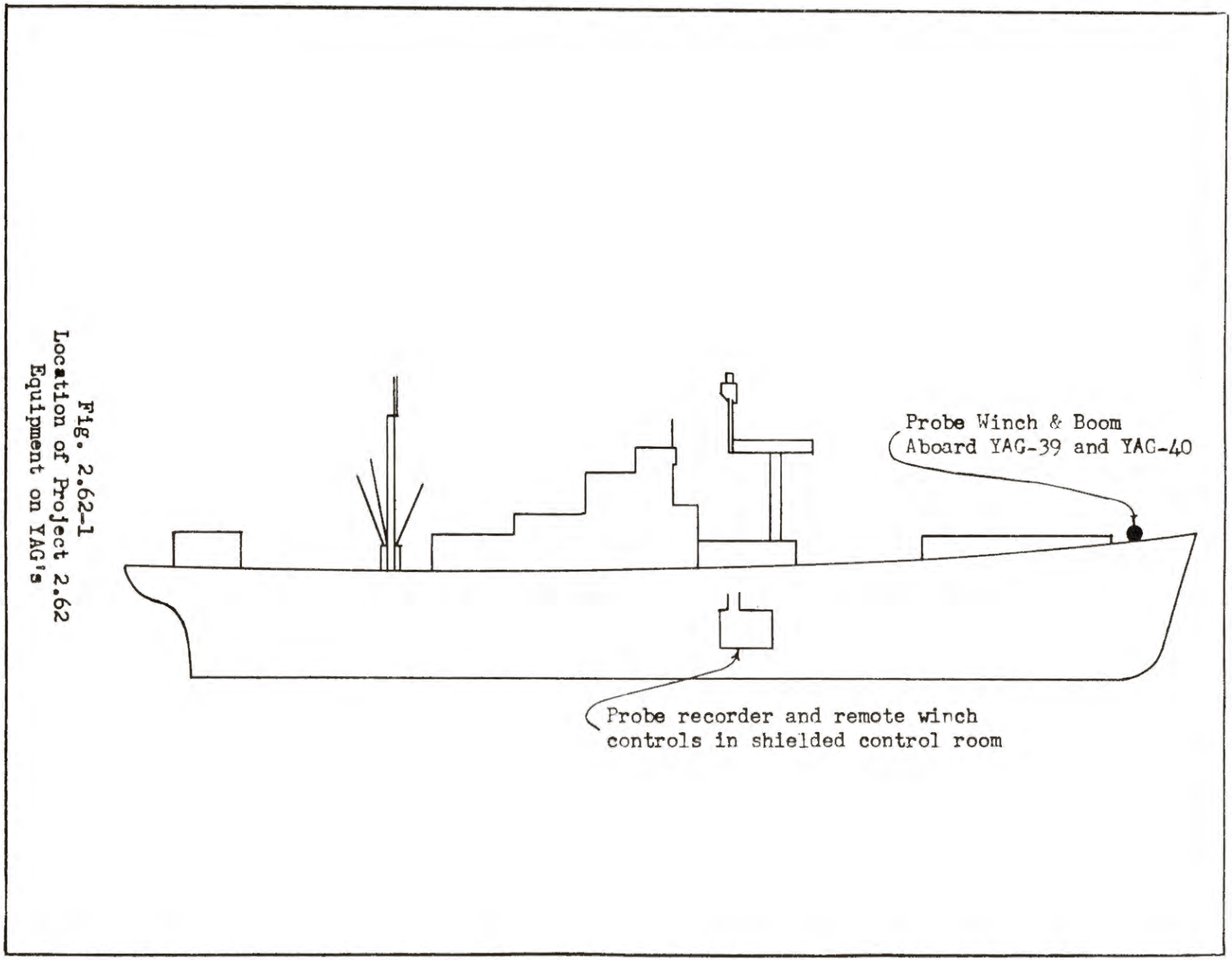

Fig. 2.62-1
Location of Project 2.62
Equipment on YAG's

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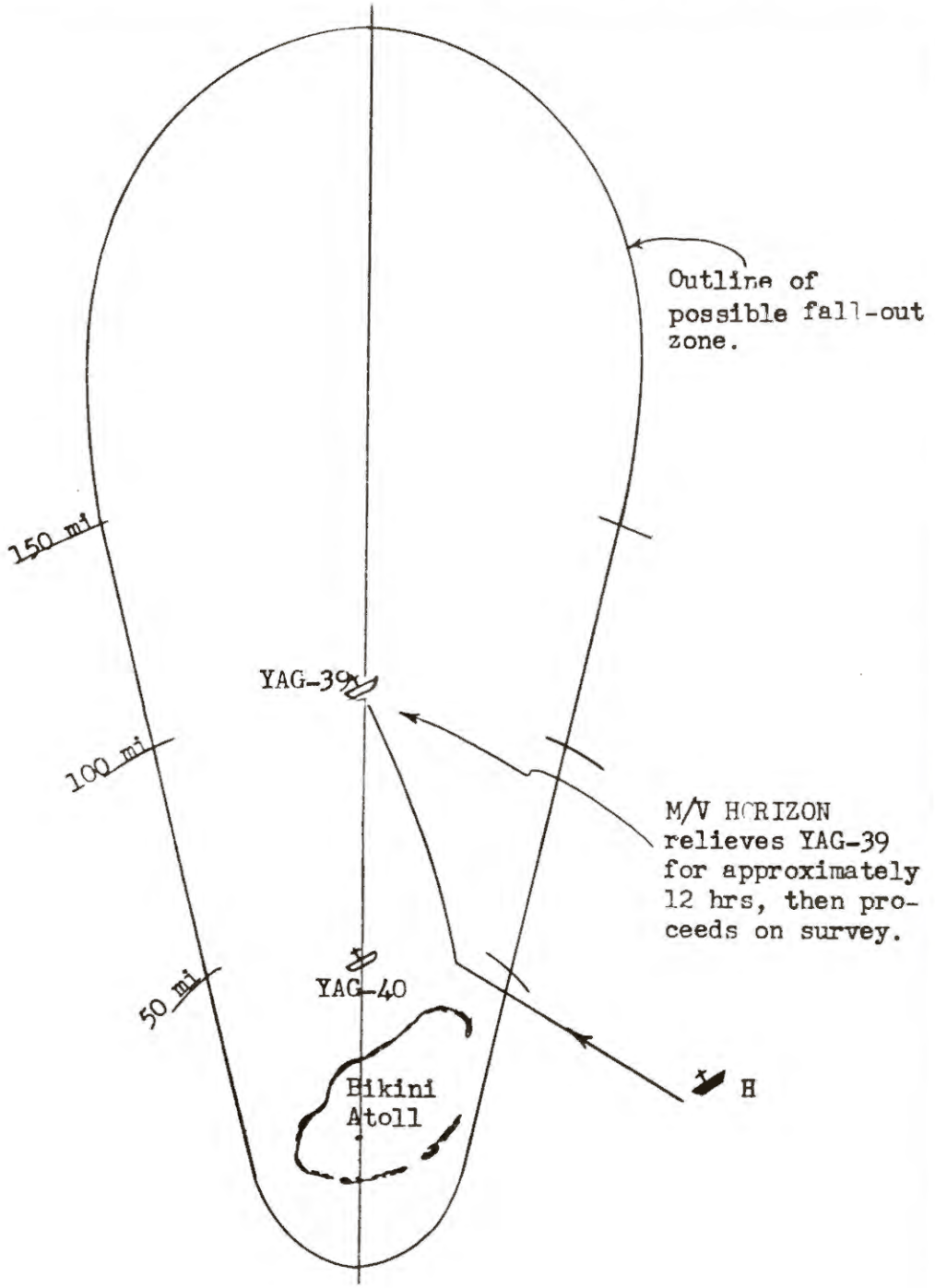


Fig. 2.62-2

2.62 M/V HORIZON DEPLOYMENT

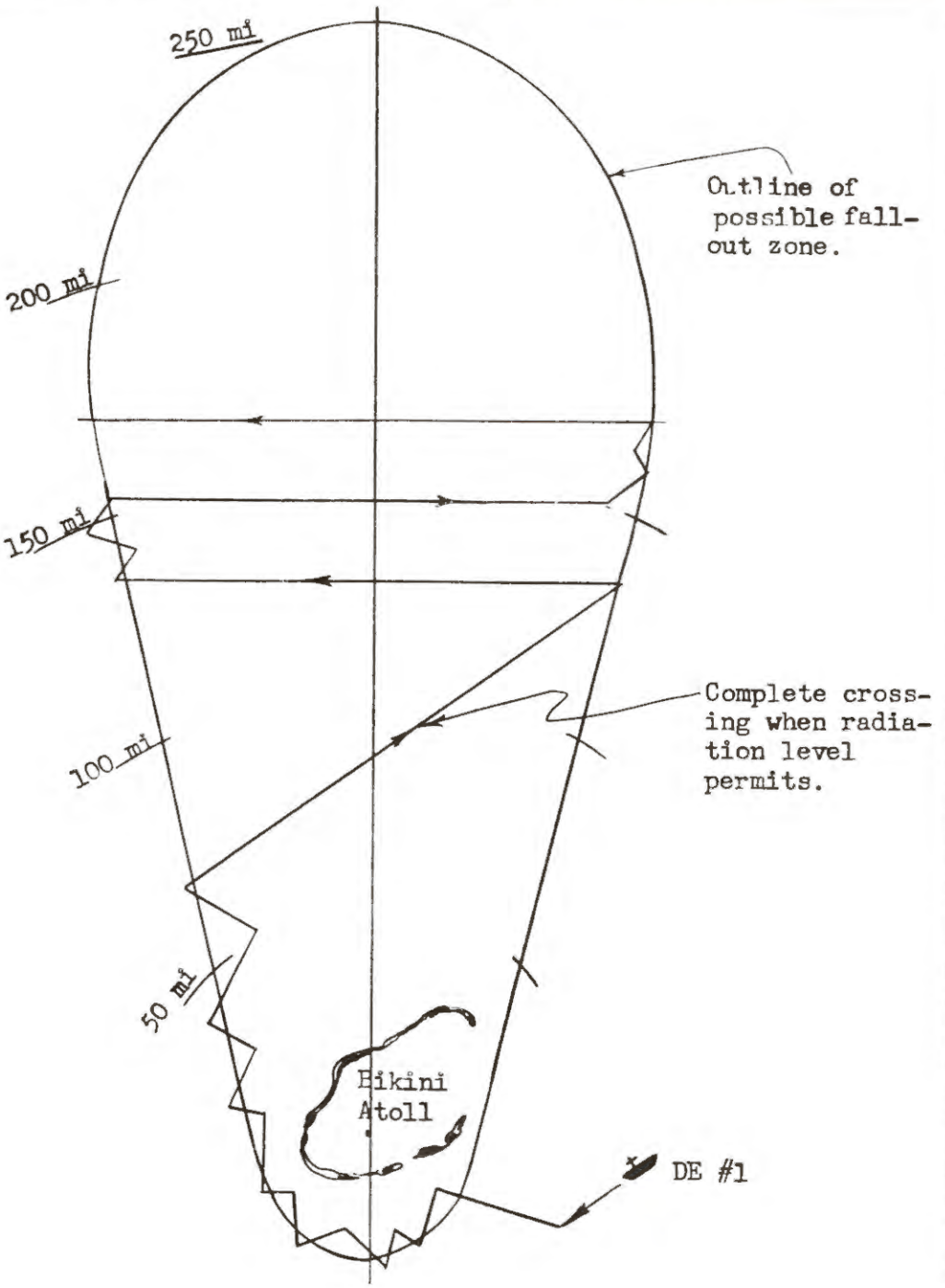


Fig. 2.62-3

2.62 DE #1 Deployment

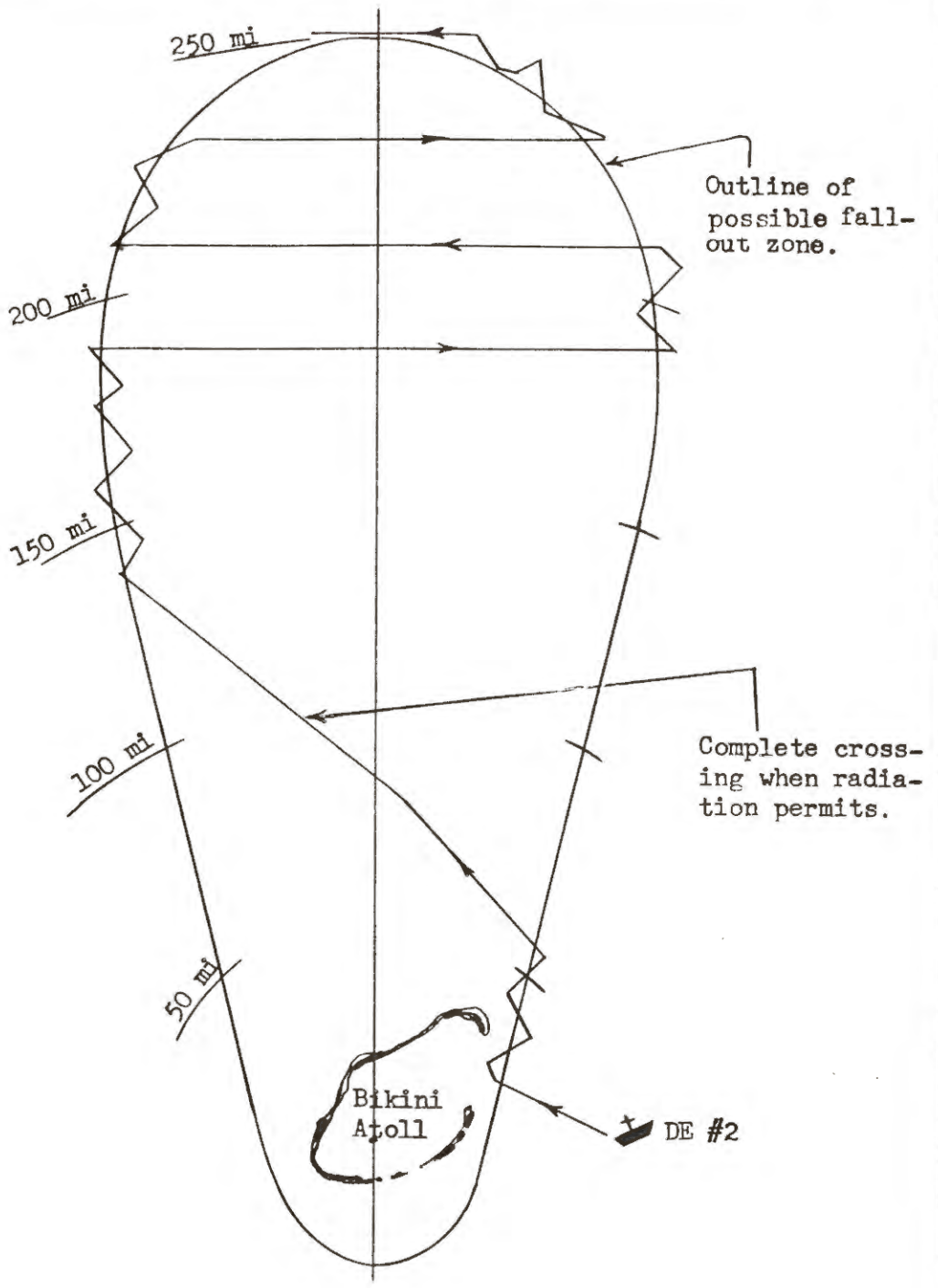


Fig. 2.62-4

2.62 DE #2 Deployment

SECTION II

PROJECT DETAIL

PROJECT 2.63 TITLE: Characterization of Fall-Out

AGENCY: NRDL

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, TEWA

Objectives:

To collect samples of fall-out and measure radiation field intensities with time at various distances from high yield land, water and air thermonuclear detonations. To study these samples from early times with respect to gamma and beta activity, to analyze them for chemical and radiochemical composition and to determine certain of their physical properties, including distributions of particle sizes. To draw conclusions which will provide a basis for the improvement of theories describing the formation, dispersion and overall characteristics of fall-out.

Description and Experimental Procedures:

1. Two YFNB barges and three pontoon rafts will be anchored in Bikini Lagoon. YFNB29 will carry two Standard Platforms with Major Arrays of instruments and YFNB13 will carry one. Each Major Array will consist of four Open-Close Total Collectors, two Always-Open Total Collectors, two Incremental Collectors, one Gamma Intensity vs. Time Recorder, one High Volume Filter Unit and one Wind Speed and Direction Recorder. The arrays on the barges will be fully automatic. Each pontoon raft will carry a Standard Station with a Minor Array of instruments consisting of an Always-Open Total Collector, a Time of Arrival Detector and a film pack to measure total dose.

2. An array of 16 skiffs will be deep-sea anchored by Project 2.62 between 10 and 30 miles from ground zero in the expected fall-out area. Each of these skiffs will be equipped with a Standard Station Minor Array as well as with a string of probes provided by Project 2.62 to measure radioactivity at a series of depths as a function of time.

3. Two YAG's will be located at distances of approximately 50 and 100 miles from ground zero and an LST at about 175 miles. Each of these will be equipped with a Standard Platform Major Array. In addition a total fall-out collector and an intermittent fall-out collector belonging to Project 2.65, as well as a dose-rate recorder belonging to Project 2.2, will be installed on each platform aboard these ships. YAG-40 will also be equipped with a Special Incremental Collector designed to deliver samples for early time studies to the shielded laboratory located on this vessel. Both YAG-39 and

YAG-40 will carry a gamma monitoring device mounted in a fixed position on a boom about 25 ft above the water surface; this boom will also carry a probe operated by a remotely-controlled winch for measuring gamma activity with depth during fall-out. The former instrument will be provided by Project 2.64 and the latter by Project 2.62. Also a Gamma Intensity vs. Time Recorder and an Open-Close Total Collector will be located on one island at Bikini in the vicinity of Project 2.65 equipment. One Standard Platform Major Array, supplemented by twelve surface-mounted Always-Open Total Collectors, and one Standard Station Minor Array will be placed on HOW Island; and, additionally, Standard Station Minor Arrays will be located on two other atoll islands.

Station Locations:

The arrangement of the YFNB barges and pontoon rafts in Bikini Lagoon is indicated in Fig. 2.63-1. The layout of skiffs in the open sea is shown in Fig. 2.63-2. The deployment of the YAG's and LST is indicated in Fig. 2.63-3. The arrangement of equipment on the YAG's, LST, and YFNB's is shown in Figs. 2.63-4, 5, and 6, respectively. The latitude and longitude coordinates of the YFNB, pontoon raft and skiff locations are listed in Table 2.63-1. It is to be emphasized, however, that the locations shown for the YAG's and LST are tentative, since the final locations for these vessels will be selected by the project scientific staff in the Program II Control Center on the basis of shot-time wind data to take maximum advantage of the actual fall-out pattern. It is also to be noted that modifications may have to be made in the locations given for the skiffs, rafts, and barges since unforeseen difficulties may be encountered in the anchoring of these craft.

TABLE 2.63-1

LOCATION OF PROJECT 2.63 SKIFF AND LAGOON STATIONS

EVENT	TYPE STATION	STATION #	LATITUDE N	LONGITUDE E
CHEROKEE	YFNB	265.01	11° 37' 8"	165° 28' 9"
	do	265.02	11° 31' 42"	165° 28' 9"
ZUNI	do	265.02	11° 39' 45"	165° 16' 27"
	do	265.02	11° 40' 11"	165° 24' 28"
FLATHEAD	do	265.02	11° 31' 42"	165 28' 9"
NAVAJO	do	265.02	11° 31' 42"	165° 19' 21"
TEWA				
CHEROKEE	Pontoon Raft	267.01	11° 35' 20"	165° 17' 30"
ZUNI	do	267.02	11° 35' 20"	165° 22' 30"
FLATHEAD	do	267.03	11° 35' 20"	165° 27' 30"
NAVAJO				
TEWA				
CHEROKEE	Skiff	263.01	12° 7' 15"	~164° 40'
ZUNI	do	263.02	12° 7' 15"	~164° 49'
FLATHEAD	do	263.03	12° 7' 15"	~165° 12'
NAVAJO	do	263.04	12° 7' 15"	165° 23' 40"
TEWA	do	263.05	12° 7' 15"	165° 39' 10"
	do	263.06	12° 7' 15"	165° 54' 40"
	do	263.07	12° 7' 15"	166° 10' 10"
	do	263.08	11° 58' 15"	~164° 56'
	do	263.09	11° 58' 15"	~165° 13'
	do	263.10	11° 58' 15"	165° 23' 40"
	do	263.11	11° 58' 15"	165° 39' 10"
	do	263.12	11° 58' 15"	165° 54' 40"
	do	263.13	11° 49' 15"	~165° 6'
	do	263.14	11° 49' 15"	165° 23' 40"
	do	263.15	11° 49' 15"	165° 39' 10"
ZUNI	2 Skiffs	263.16--.17	About 10 miles South of TARE	

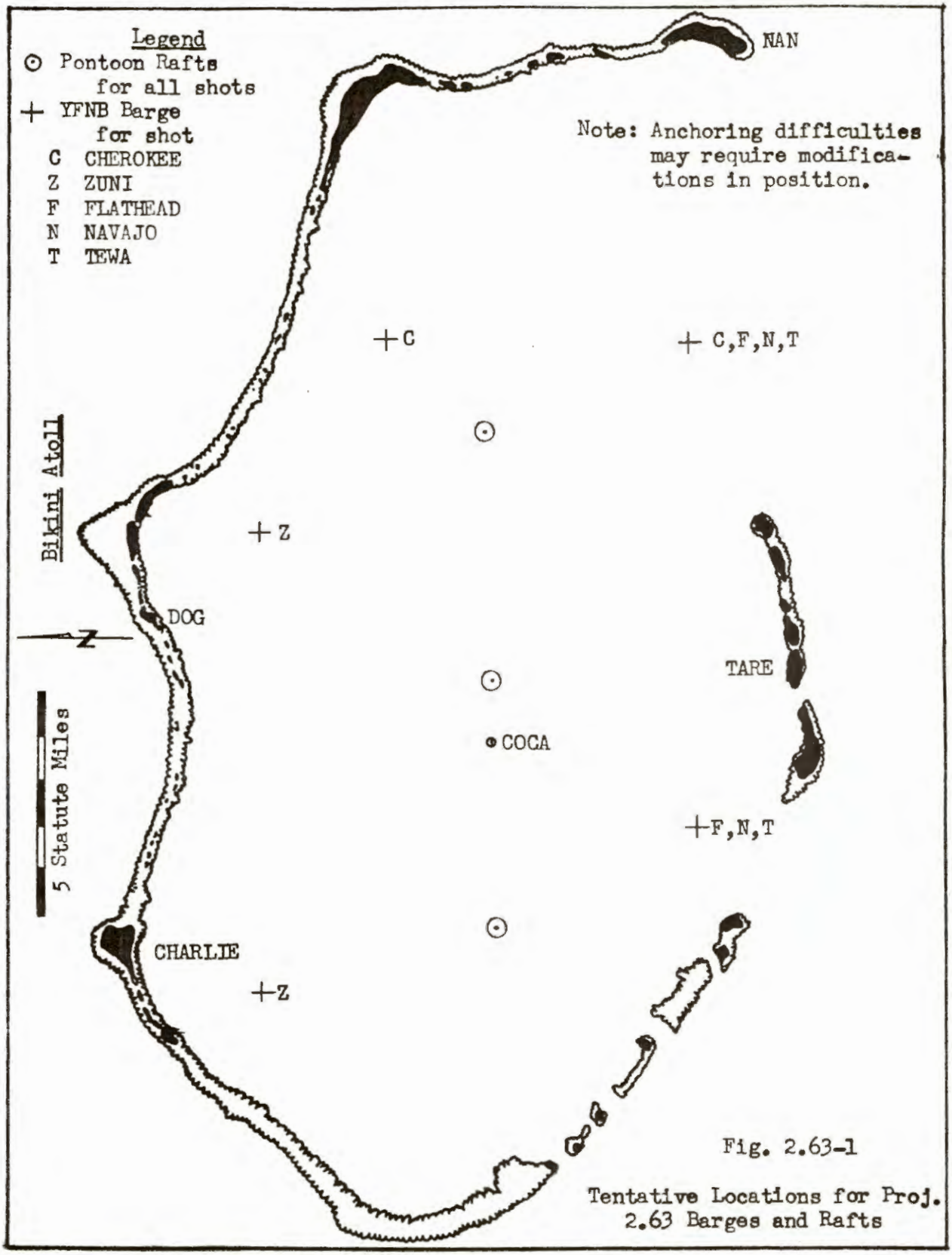
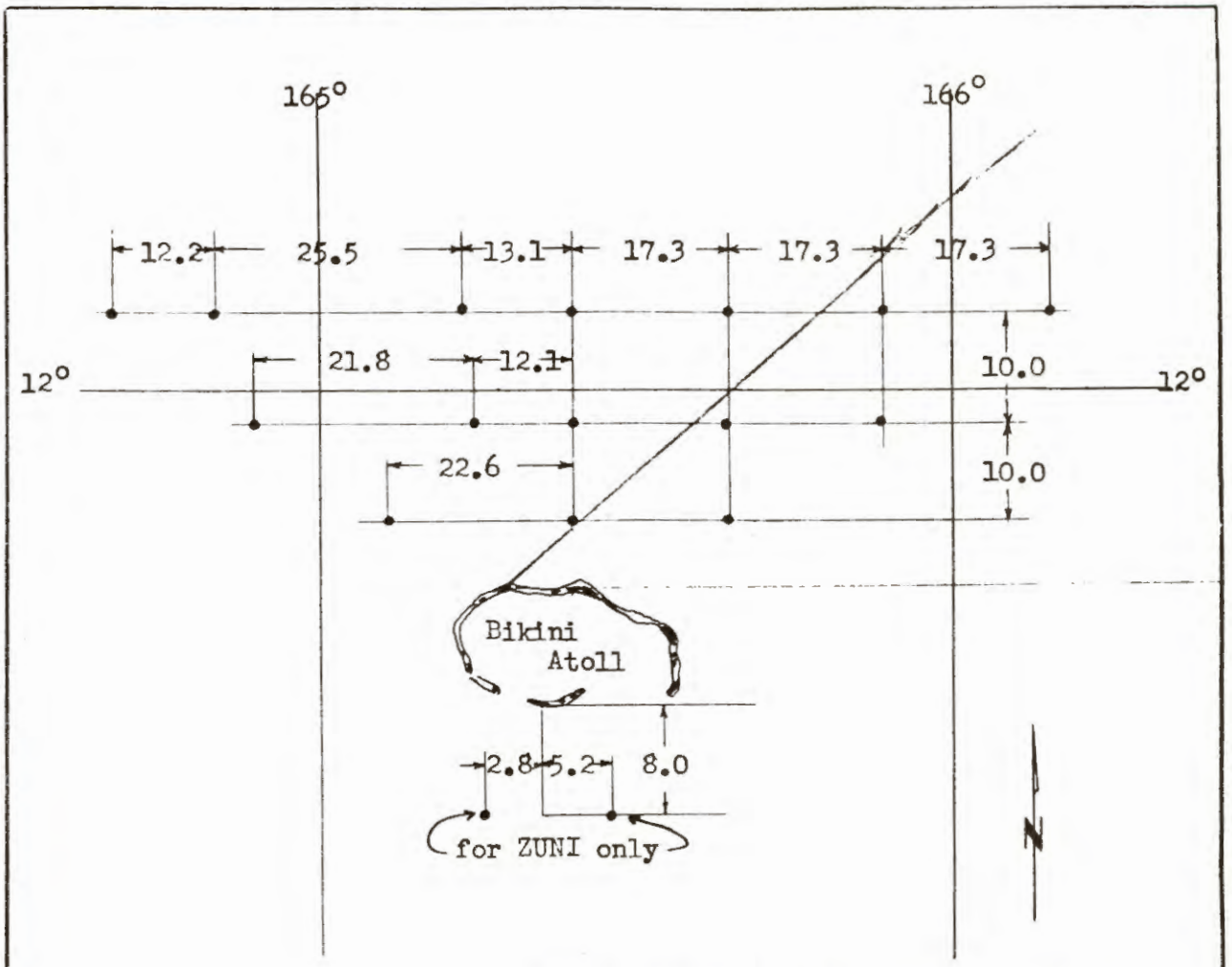


Fig. 2.63-1

Tentative Locations for Proj. 2.63 Barges and Rafts



Note: Anchoring difficulties may require modifications in positions.
Note: All dimensions in nautical miles.

Fig. 2.63-2

Tentative Skiff Locations

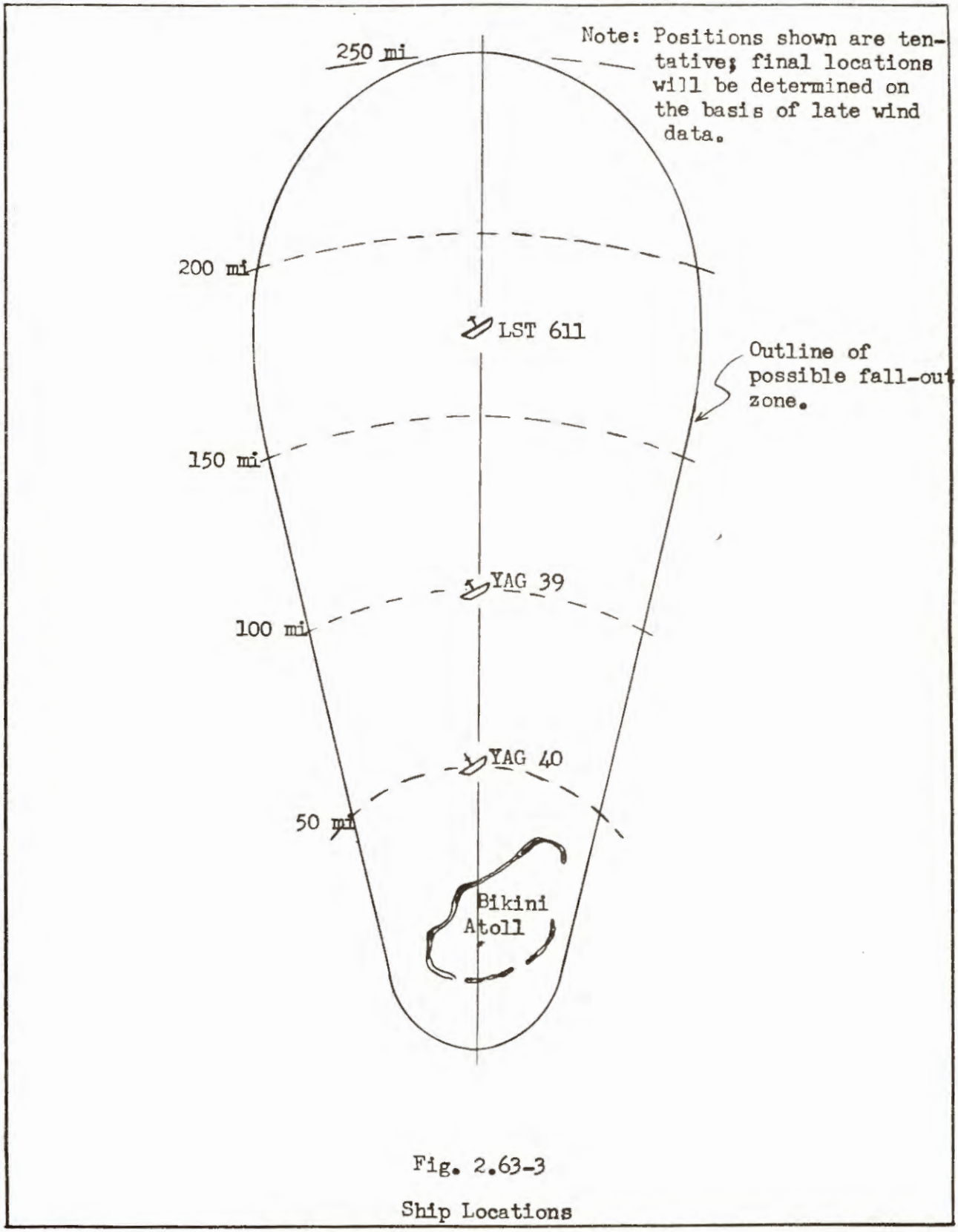


Fig. 2.63-3

Ship Locations

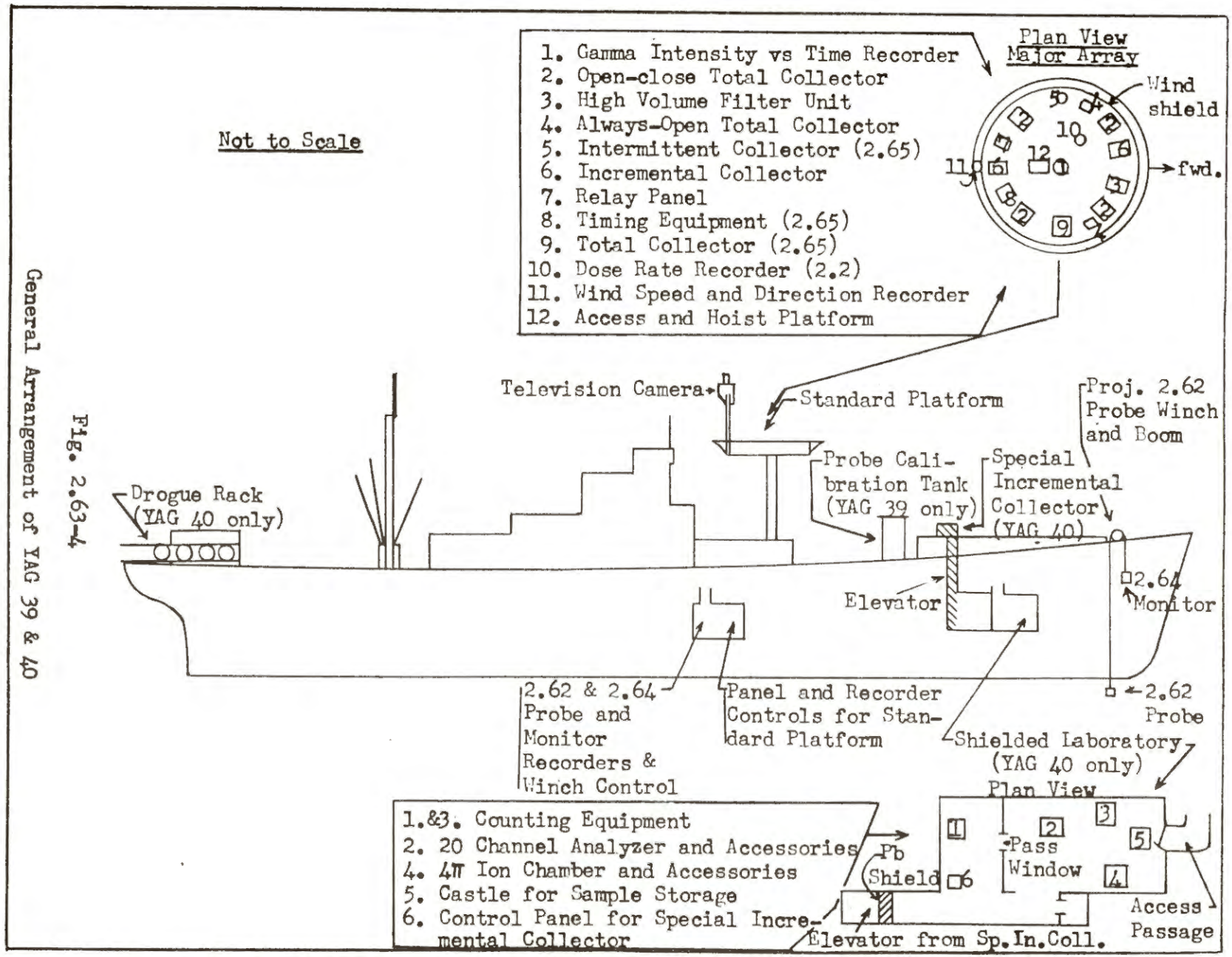


Fig. 2.63-4 General Arrangement of YAG 39 & 40

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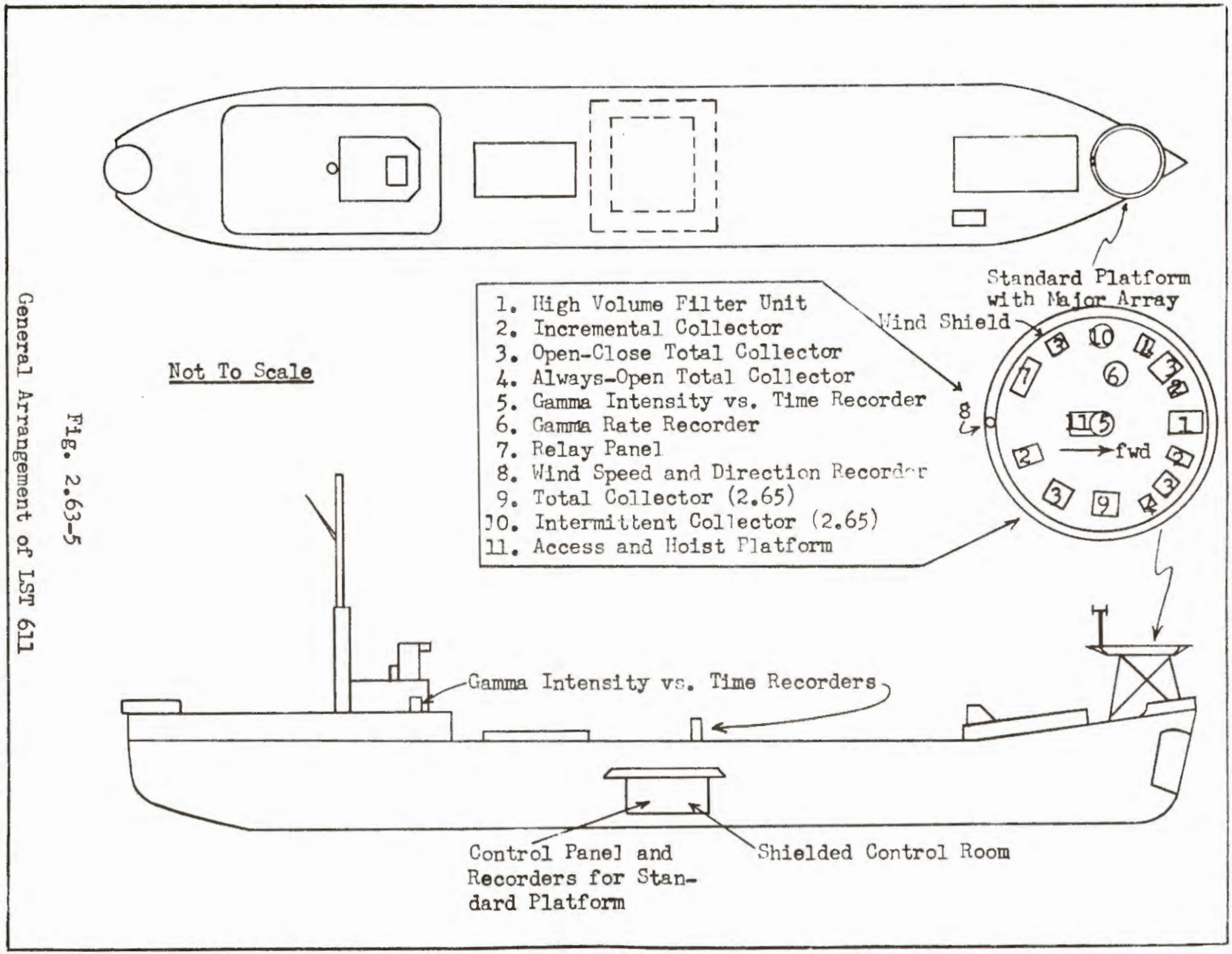

Fig. 2.63-5 General Arrangement of LST 611

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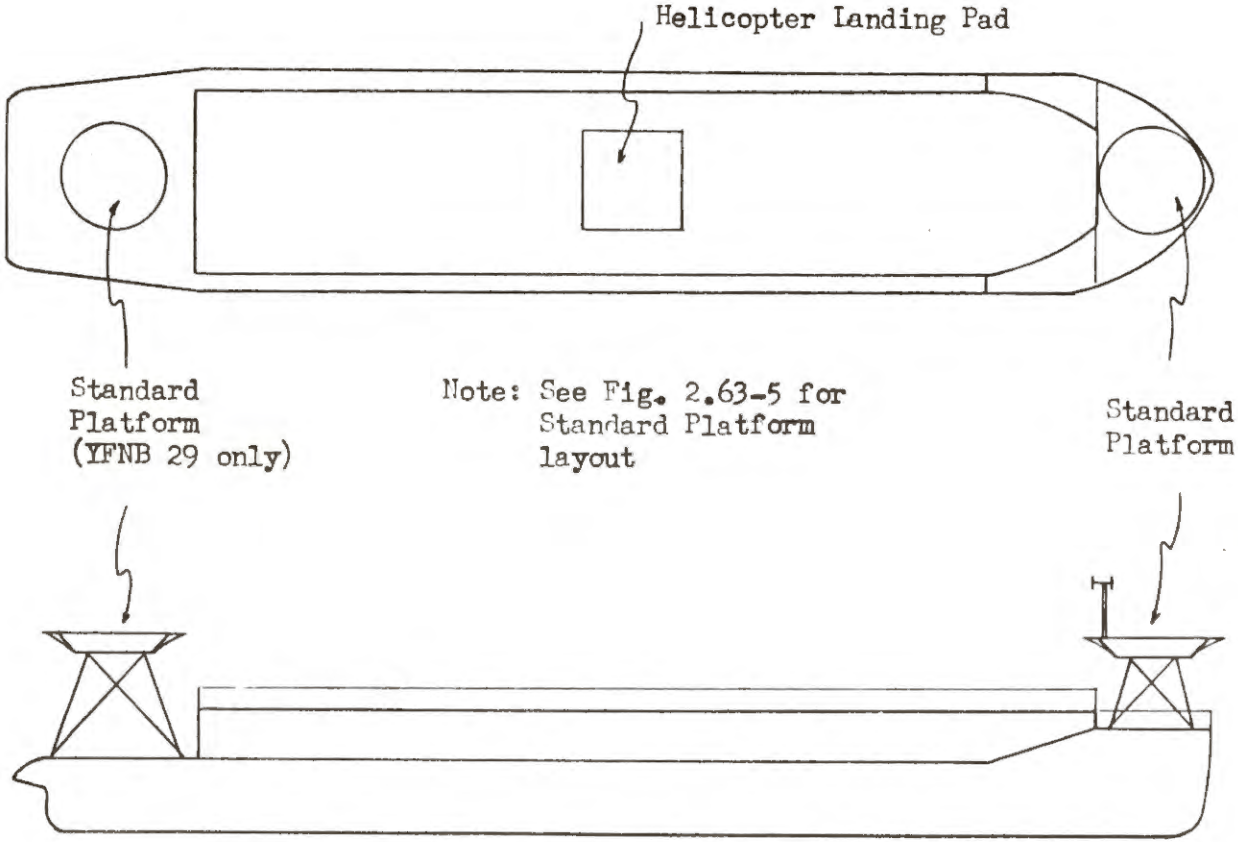

Fig. 2.63-6

General Arrangement of YFNB 13 and YFNB 29

SECTION II

PROJECT DETAIL

PROJECT 2.64

TITLE: Fallout Location and Delineation by Aerial Survey

AGENCY: NYOO-AEC

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE TEWA. Also calibration on NAVAJO, SEMINOLE and MOHAWK.

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Objectives:

To survey the gamma radiation from fall-out contaminated ocean areas using an aircraft borne detector. To make air absorption measurements to correlate the aircraft data with the intensities measured at the surface of the sea.

Description and Experimental Procedures:

1. Three P2V-5 aircraft, BUNOS 131453, 131457, 131463 will be equipped with gamma radiation detectors to record the dose rate arriving through the thin aircraft skin from a water surface below. A fourth aircraft, BUNO 128412 will be available on a non-interference basis with the security mission and will be provided with detector and electronics.

2. Two aircraft will fly over the fall-out area simultaneously and observe the radioactivity and altitude (operating altitude 200-400 feet). Since the surface radioactivity will decrease rapidly due to decay and dilution, it is desirable to have one pair of aircraft for the D-day and D plus 1 surveys, and another uncontaminated pair, if available, on D plus 2 and D plus 4 and possibly D plus 3, D plus 5 and/or D plus 6. The information on radiation dose rate and altitude will be continuously recorded and telemetered to the Program Two Control Center aboard the USS ESTES. There the telemetered information will be correlated with the positioning data of the aircraft which will be relayed over a communication channel between navigator and the project plotter.

3. On D-day two aircraft will survey near the atoll when the fall-out is complete. One aircraft will also survey near the YAG-39 and YAG-40 positions if fall-out has ceased before they return to base. On subsequent days the aircraft will follow a 9 to 9½ hour flight plan which will include surveys over the atoll as well as flights out to the end of the isodose plot (150 to 300 miles). Samples of contaminated water will be obtained from Project 2.62 to measure the decay time of the radioactivity in order to extrapolate the measurements back to the fall-out time.

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4. Since the activity measurements will be performed at an altitude of 200-400 feet, a helicopter will be employed to carry a portable gamma spectrum analyzer to evaluate the attenuation of the radiation in air. These flights will be performed on the MOHAWK, NAVAJO and SEMINOLE shots.

Station Locations:

Fig. 2.64-1 is a diagram of the radiation monitoring equipment aboard the P2V-5's. Fig. 2.64-2 is a block diagram of the circuitry aboard the aircraft. The tentative flight plans for the aircraft are shown below. More detailed plans will be drawn prior to each shot. Operational changes will be made in flight, by radio, based on the development of the central plot.

A/C Survey 1

0 minutes - Leave base

60 minutes - Enter area

120 minutes - circle 50 mi diameter

140 minutes - diagonal across atoll

180 minutes - return to atoll, coordinate with station

240 minutes - diagonal across minor fall-out axis to distances necessary to close isodose plot.

290 minutes - return along minor axis

400 minutes - close diagonals to fill in plot to 100 miles

440 minutes - return on major fall-out axis

480 minutes - coordinate with atoll stations

540 minutes - return to base

9 hours

A/C Survey 2

0 minutes - Leave base

60 minutes - Enter area

90 minutes - circle 20 mile diameter

105 minutes - diagonal across atoll

120 minutes - diagonal across major fall-out axis

135 minutes - coordinate YAG-39 and YAG-40

290 minutes - diagonals to end of isodose plot (at 150 to 300 miles)

510 minutes - return down major fall-out axis

570 minutes - return to base

9½ hours

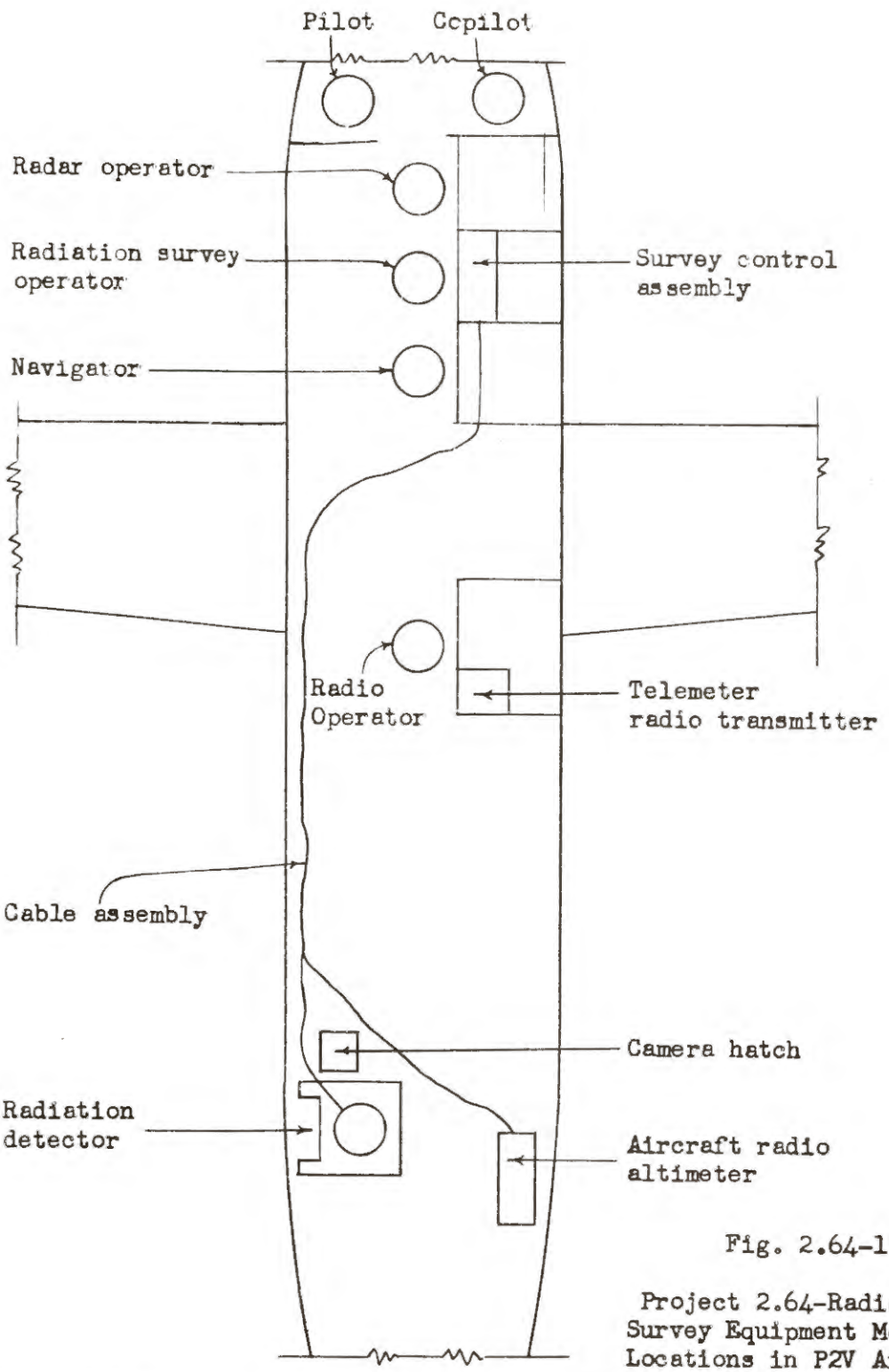

Fig. 2.64-1

Project 2.64-Radiation Survey Equipment Mounting Locations in P2V Aircraft

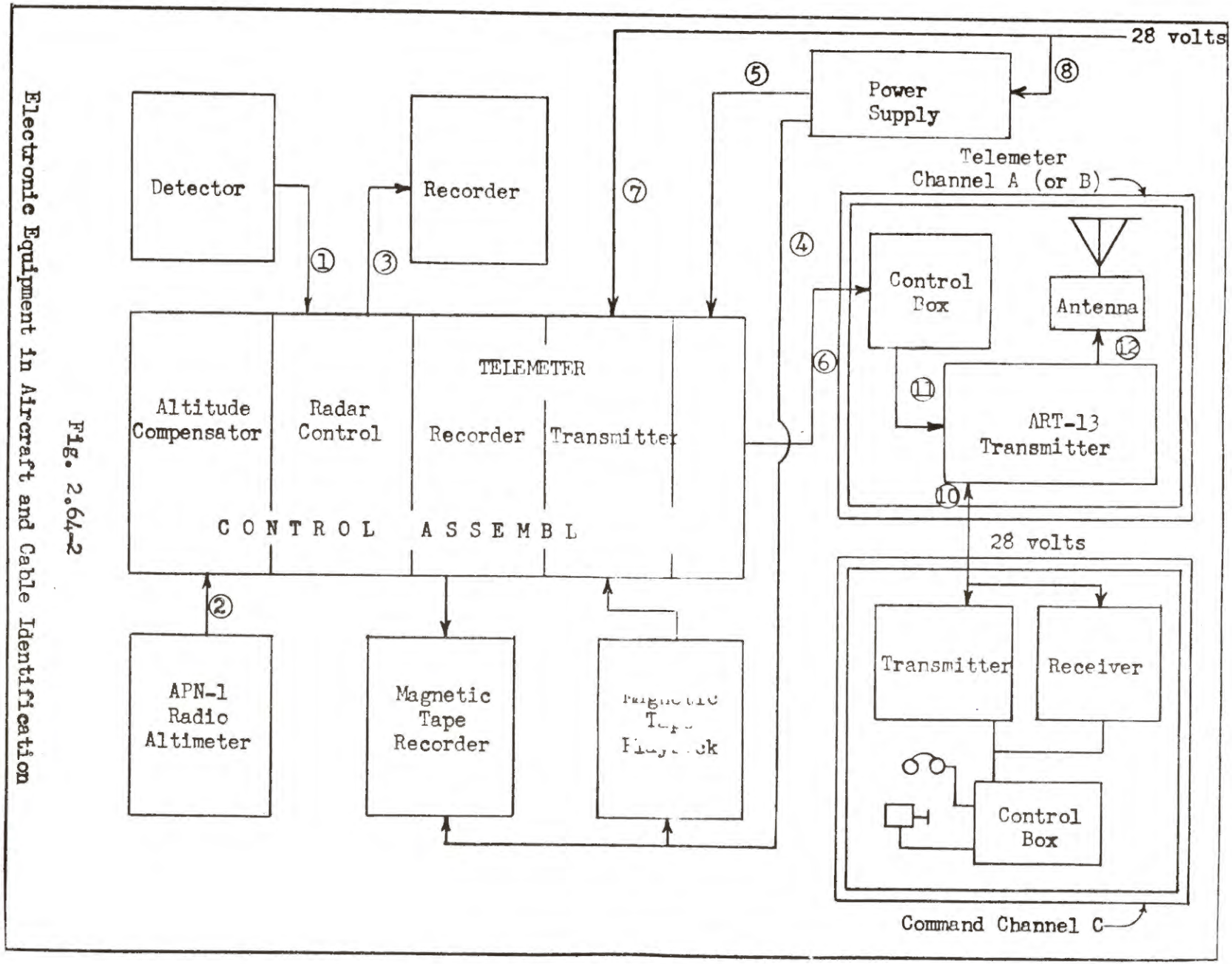

Fig. 2.64-2 Electronic Equipment in Aircraft and Cable Identification

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SECTION II

PROJECT DETAIL

PROJECT 2.65 TITLE: Land Fall-out Studies

AGENCY: CWL, ACC

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, LACROSSE TEWA.

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Objectives:

1. To obtain fall-out samples on land and to perform radiophysical and radiochemical measurements on the samples.

2. To prepare dose rate contours of the atoll area from information gathered by this project, other projects, and Rad-Safe.

3. To evaluate the role of the base surge in transport of radioactive material.

Description and Experimental Procedures:

1. Intermittent fall-out collectors and gross fall-out collectors will be installed on islands in the Bikini Atoll and on the YAG's and LST in the fall-out zone. The IFC timing intervals will be 1 min, 5 min or 30 min, depending on location and type of shot. The equipment will be installed prior to the shots, will be activated by Blue Boxes, and recovery will begin by helicopter on D plus 1. A wire or radio signal will be used to activate base surge detectors. Some of the stations will also incorporate a tape fall-out monitor. Stations at Eniwetok Atoll will be provided with gross fall-out collectors, tape fall-out monitors, and Project 2.1 dosage detectors. A station at the Rongerik Weather Station will be implemented with a tape fall-out monitor and a large gross fall-out collector with a time of arrival detector and two aerosol filter samplers.

2. On D-day, D plus 1, and D plus 3 of the CHEROKEE, ZUNI, and NAVAJO shots, two helicopters will perform an aerial radiation survey over the atoll islands. The measurements will be taken by means of a probe on a long cable suspended below the hovering helicopter. Early on D-day of the ZUNI and LACROSSE shots a close-in survey near the craters will be performed in a similar manner. The positions of the helicopters will be plotted by radar fix from the USS CURTIS and checked by landmarks. Two project personnel will be stationed in the Program Two Control Center to consolidate data from the various projects into isodose maps, and assist Program with general plot.

3. At four Bikini Atoll stations base surge detectors will record the arrival of the base surge. The effect of the base surge in transporting

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radioactive material will be evaluated by correlating the time of arrival with the Project 2.2 gamma vs. time record and the intermittent fall-out collector data. Radiochemical analysis will be performed on the intermittent fall-out collector samples in an attempt to establish whether the base surge is a contaminating event independent of the fall-out.

Station Locations:

The instrumentation at the various stations is summarized in Table 2.65-1 and displayed on Figs. 2.65-1 and 2.65-2. The distant collector is shown on Fig. 2.65-3 and the location of the collectors on the YAG's on Fig. 2.65-4. The routes of the survey helicopters are indicated on Figs. 2.65-5,6,7,8 and 9.

TABLE 2.65-1

Station	Island	Coordinates N	Coordinates E	Intermittent Fall-Out Collector (IFC)	Cross Fall-Out Collectors (GFC)	Base Surge Detectors (BSD)	Tape Fall-Out (TFM)	Distant Fall-Out Collectors w/Time of Arrival Detector and two filter samplers (DFS)	Proj. 2.1 Dosage Meters (DM)
268.02	CHARLIE	172,500	80,950	1	1	0	1	0	1
268.03	CHARLIE	172,490	80,948	1	0	0	0	0	0
268.04	DOG	169,750	117,000	1	1	0	0	0	1
268.05	FOX	171,050	126,500	1	1	0	0	0	0
269.01	FOX	171,034	126,512	0	0	1*	0	0	0
268.06	GEORGE	168,900	131,050	1	1	0	0	0	1
269.02	GEORGE	168,872	131,060	0	0	1*	0	0	0
268.07	GEORGE	168,891	131,053	1	0	0	0	0	0
268.08	HOW	147,820	171,050	1	1	0	1	0	1
268.09	HOW	147,810	171,047	1	0	0	0	0	0
268.10	LOVE	124,700	178,250	1	1	0	0	0	1
268.11	NAN	104,461	178,946	1	1	0	0	0	1
268.12	NAN	104,451	178,946	1	0	0	0	0	0
268.13	OBOE	102,900	126,393	1	1	0	0	0	1
269.03	OBOE	102,770	126,405	0	0	1#	0	0	0
268.14	OBOE	102,800	126,400	1	0	0	0	0	0
268.15	OBOE	102,730	126,402	1	0	0	0	0	0
268.16	UNCLE	98,194	99,994	1	1	0	0	0	1
269.04	UNCLE	98,165	99,999	0	0	1#	0	0	0
268.17	UNCLE	98,184	99,996	1	0	0	0	0	0
268.18	VICTOR	106,600	82,600	1	1	0	0	0	0
268.19	VICTOR	106,610	82,602	1	0	0	0	0	0
268.20	YOKE	116,520	70,130	1	1	0	1	0	0

*FLATHEAD, NAVAJO, APACHE #ZUNI

TABLE 2.65-1 (Cont'd)

Station	Island	Coordinates N	Coordinates E	Intermittent Fall-Out Collector (IFC)	Gross Fall-Out Collectors (GFC)	Base Surge Detectors (BSD)	Tape Fall-Out (TFM)	Distant Fall-Out Collectors w/Time of Arrival Detector and two filter samplers (DFS)	Proj. 2.1 Dosage Meters (DM)
268.21	YOKE	116,520	70,130	1	0	0	0	0	0
268.22	BRAVO	127,212	56,693	1	1	0	0	0	0
268.01	ABLE	167,800	70,800	1	1	0	0	0	0
270.01	COCA			1	1	0	1	0	0
	YAG-39			1	1	0	0	0	1
	YAG-40			1	1	0	0	0	1
	LST-611			1	1	0	0	0	1
	RONGERIK			0	0	0	1	1	0
270.05	WILMA	Unknown		0	1	0	1	0	1
270.06	BRUCE			0	1	0	1	0	1
270.07	LEROY			0	1	0	1	0	1
270.08	MACK			0	1	0	1	0	1

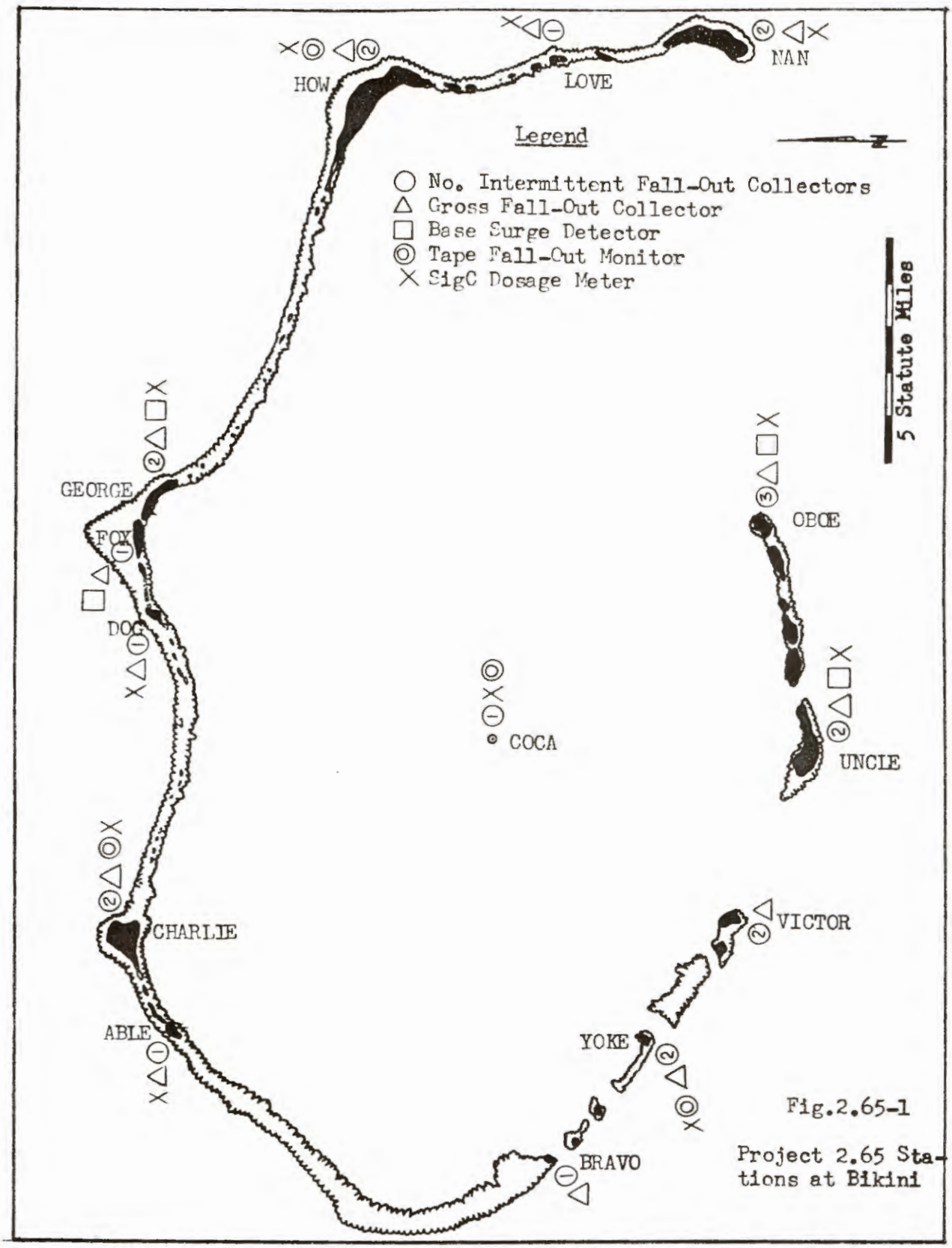


Fig.2.65-1

Project 2.65 Stations at Bikini

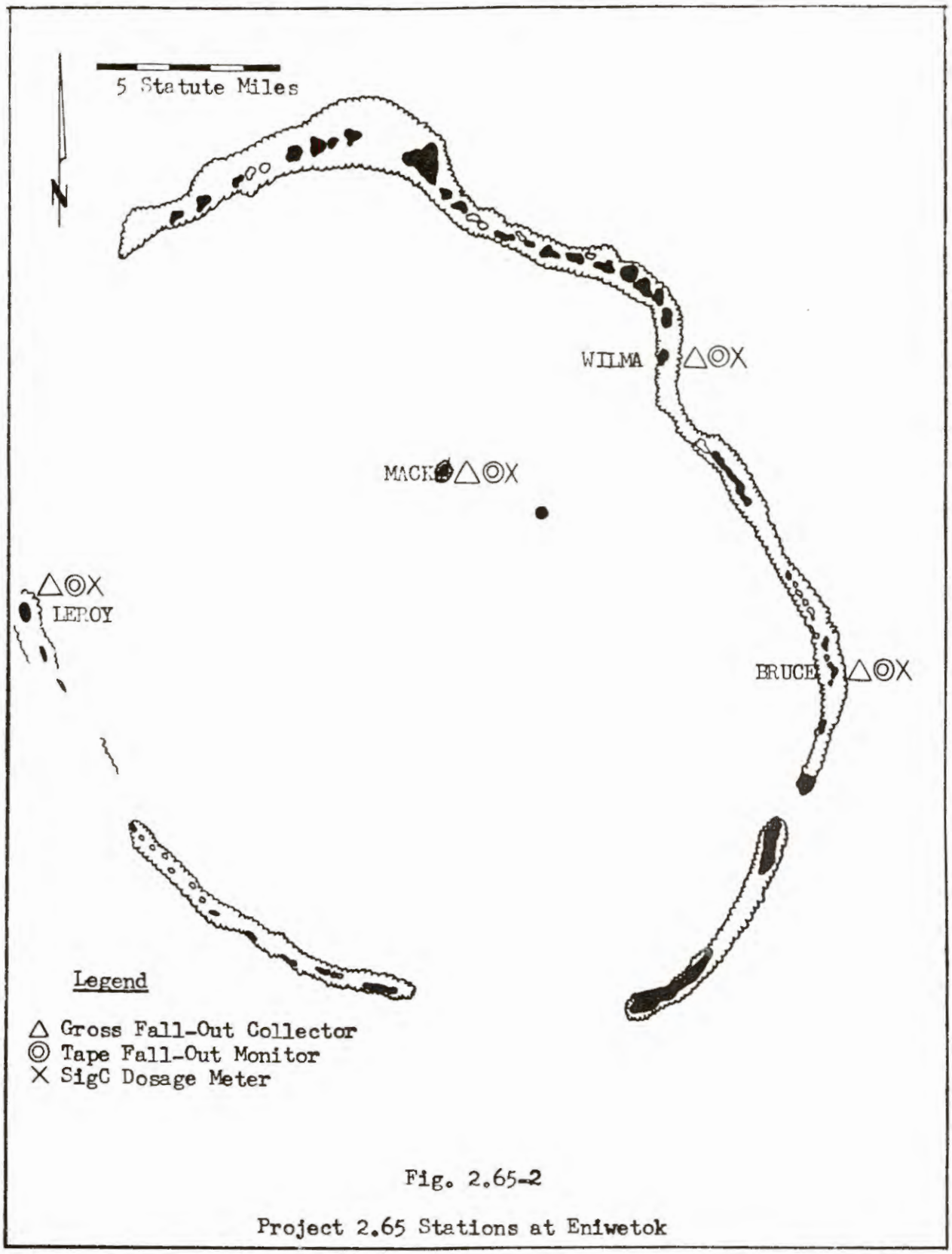
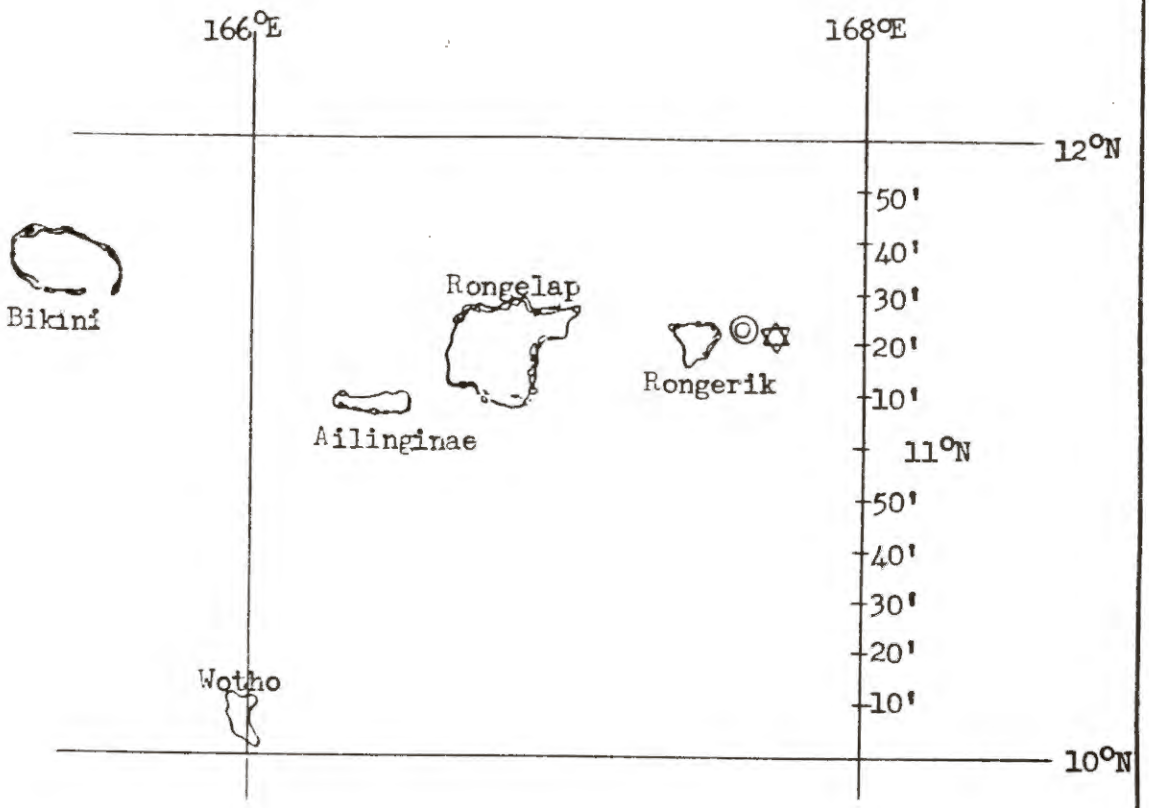


Fig. 2.65-2

Project 2.65 Stations at Eniwetok



Legend

◎ Tape Fall-Out Monitor
✡ Distant Gross Fall-Out Collector with Time of Arrival Detector and Two Filter Samplers

Fig. 2.65-3

Distant Fall-Out Collection Station

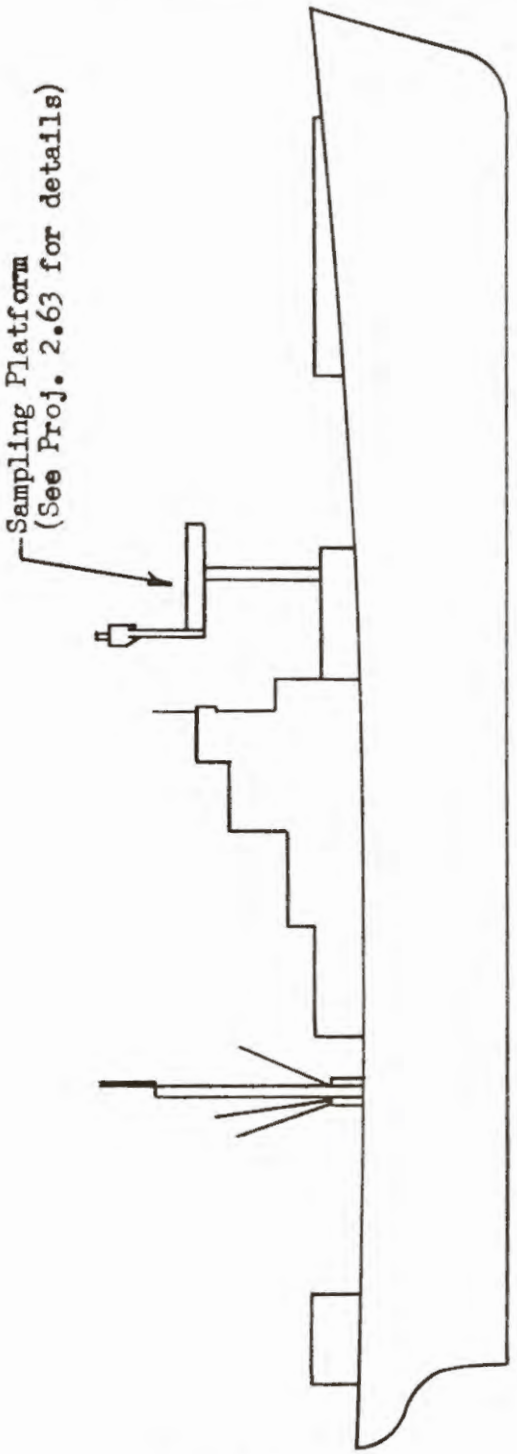


Fig. 2.65-4

Intermittent and Gross Fall-Out Collectors on Sample Platforms of YAG 39&40
(Also SigC Dose Rate Meters)

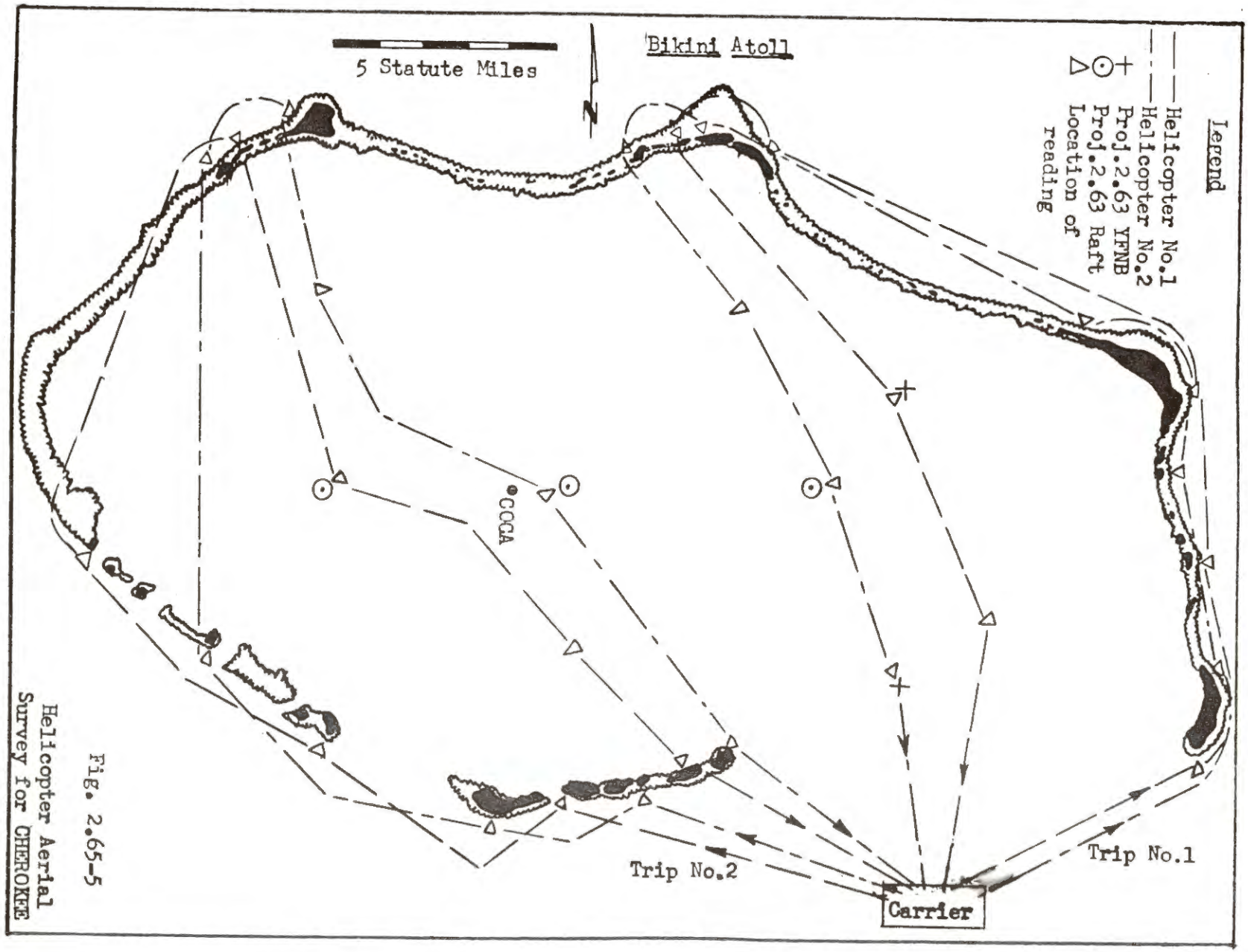


Fig. 2.65-5
Helicopter Aerial Survey for CHEROKEE

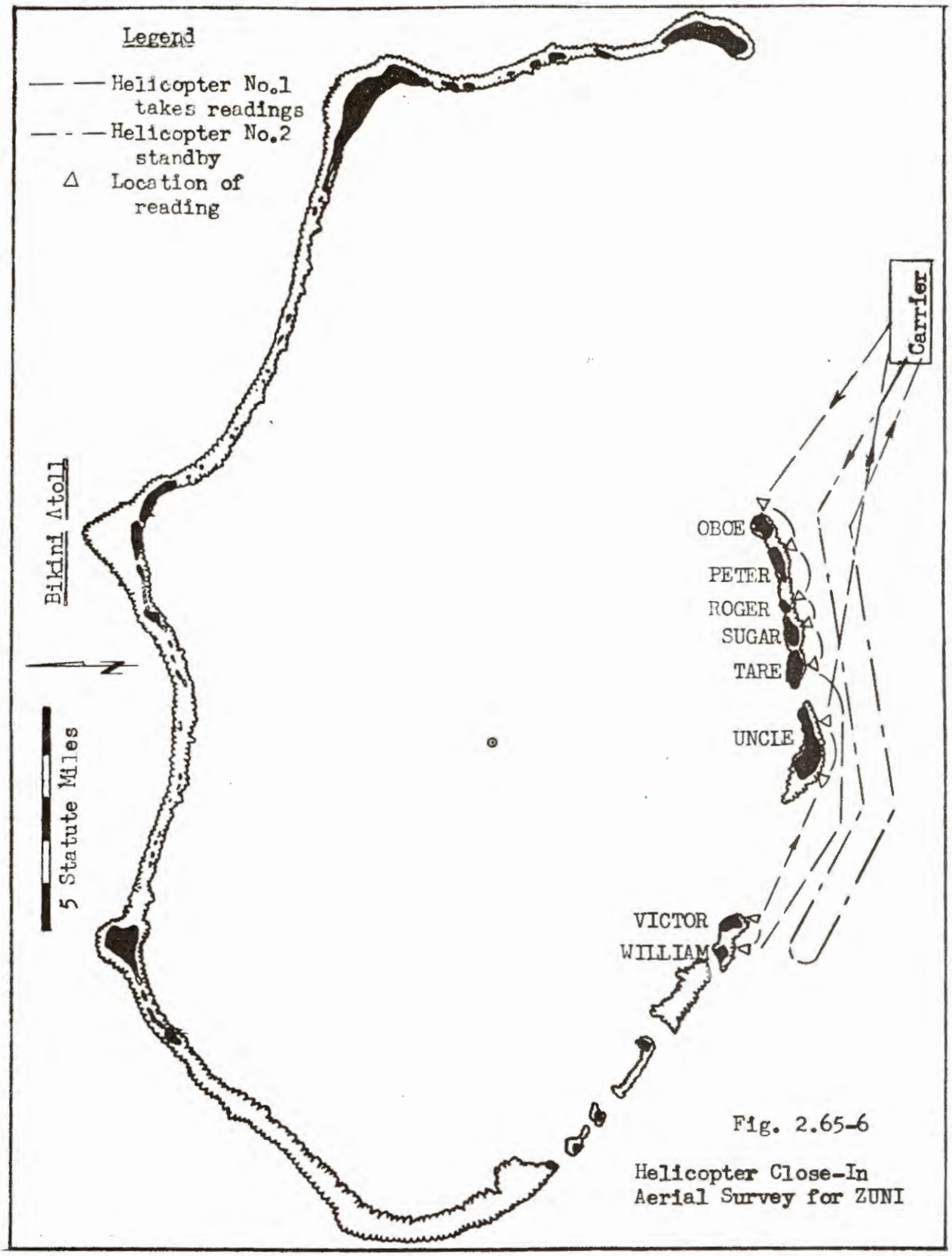


Fig. 2.65-6

Helicopter Close-In Aerial Survey for ZUNI

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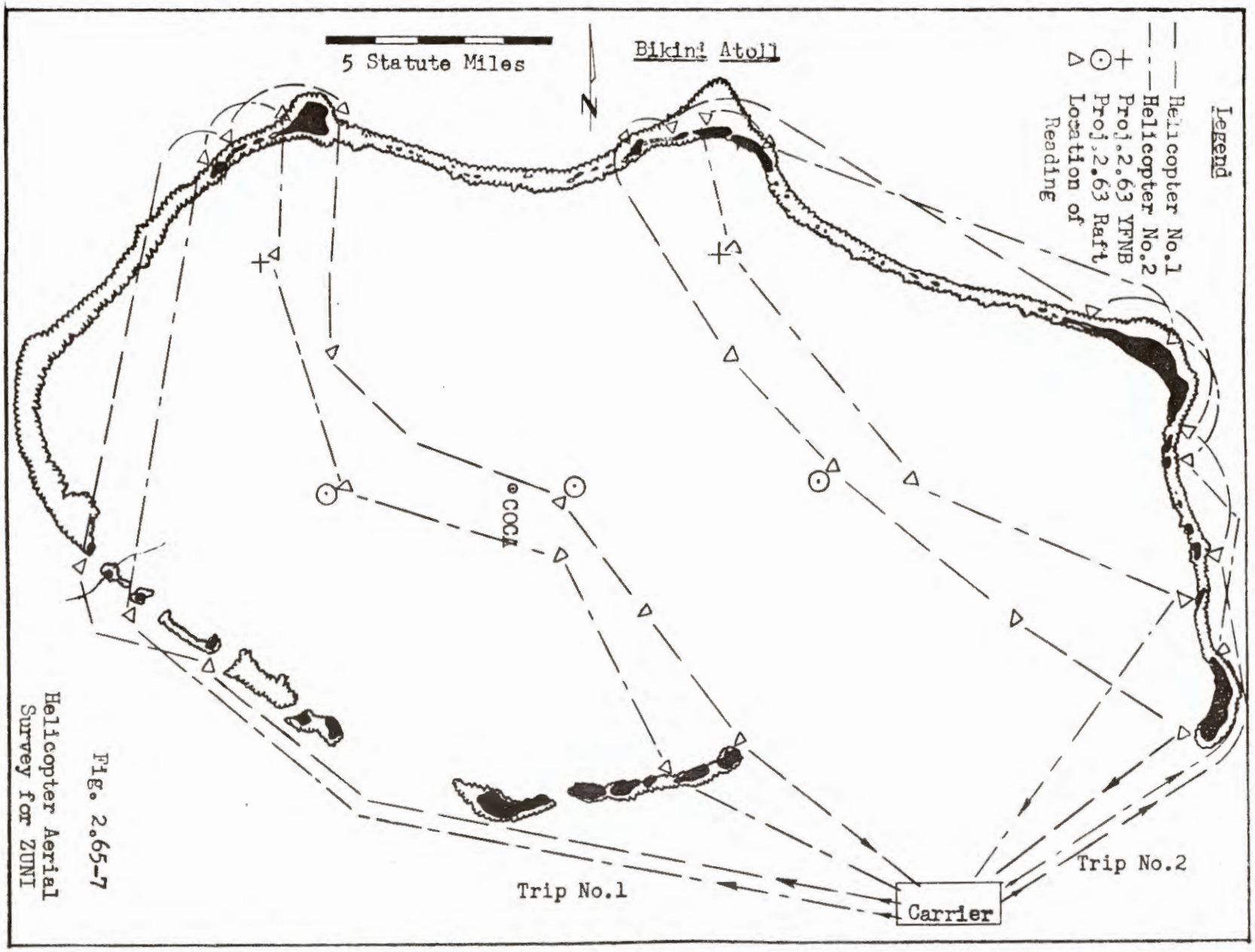

Fig. 2.65-7
Helicopter Aerial Survey for ZUNI

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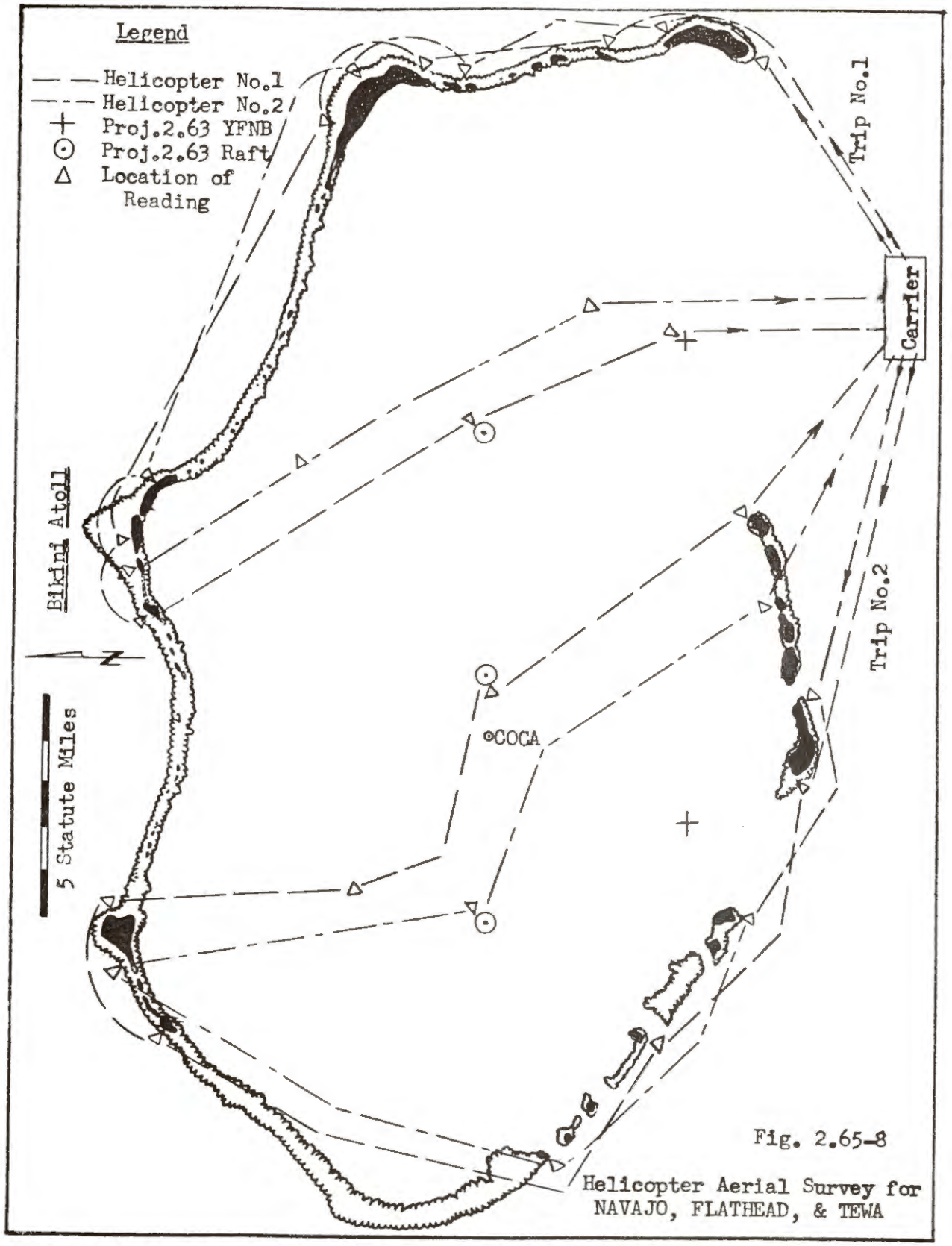

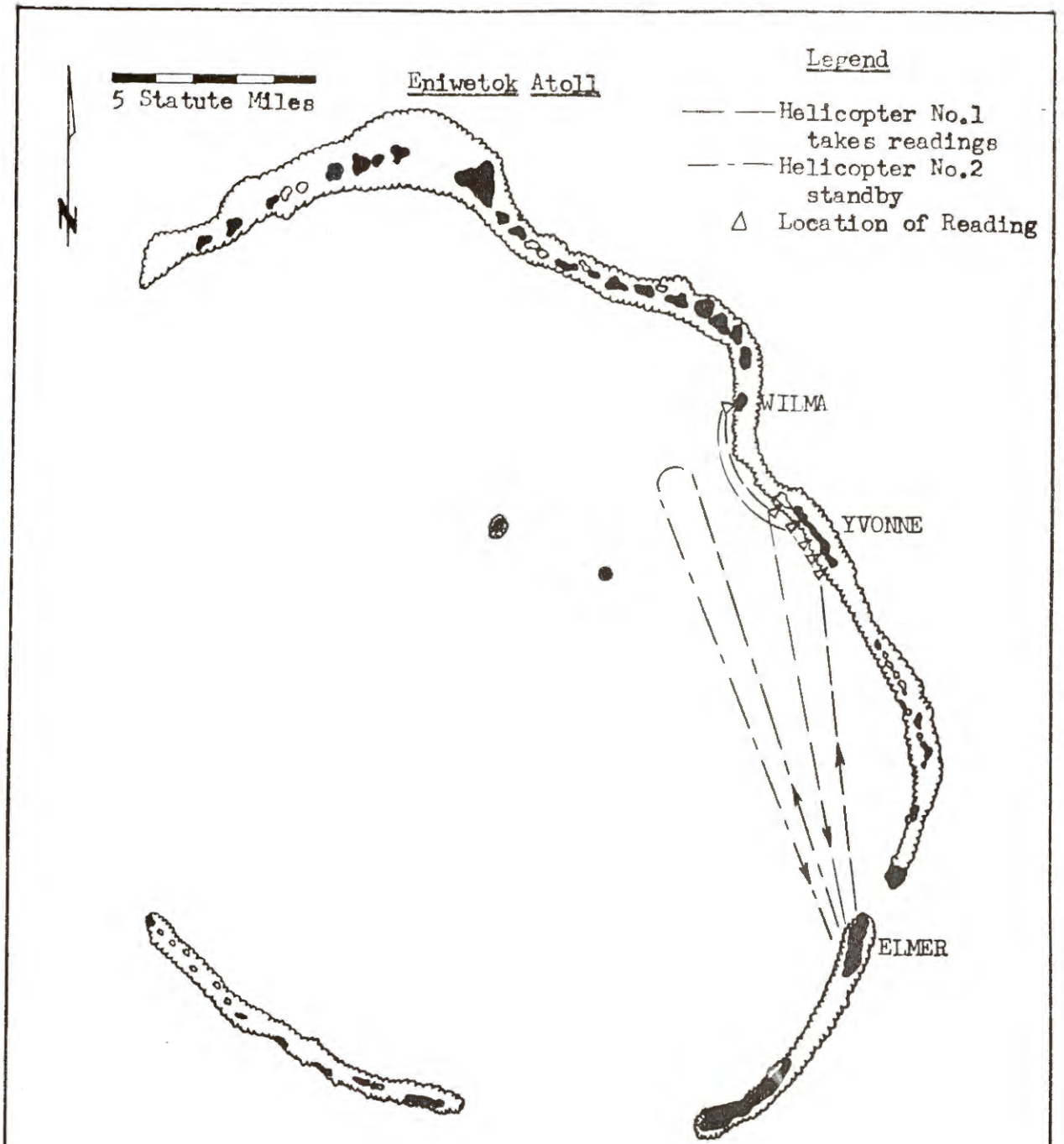

Fig. 2.65-9

Helicopter Close-In Aerial Survey for LACROSSE

SECTION II

PROJECT DETAIL

PROJECT - 2.66 TITLE: Early Cloud Penetration

AGENCY: AFSWC/ARDC

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE, TEWA

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Objectives:

1. To collect and evaluate data relating to radiation dose rate vs. time in radioactive clouds

2. To measure and evaluate the radiation hazards associated with the residual contamination on aircraft which have flown through thermonuclear clouds at early times after detonation.

3. To measure the turbulence in cloud at early times after detonation.

Description and Experimental Procedures:

1. Five B57-B aircraft, instrumented to measure radiation dose rate, integrated dose, and turbulence will be flown through the stem at varying times and altitudes just following the detonation. Altitudes of penetrations will be increased and the time after detonation will be decreased with each succeeding shot and the extent of these flights will of necessity be developed in the field.

2. Immediately after penetration the aircraft will return to base and land. Studies of the contact radiation intensities will then be made.

3. The tentative flight plan for the aircraft is indicated on Fig. 2.66-1.

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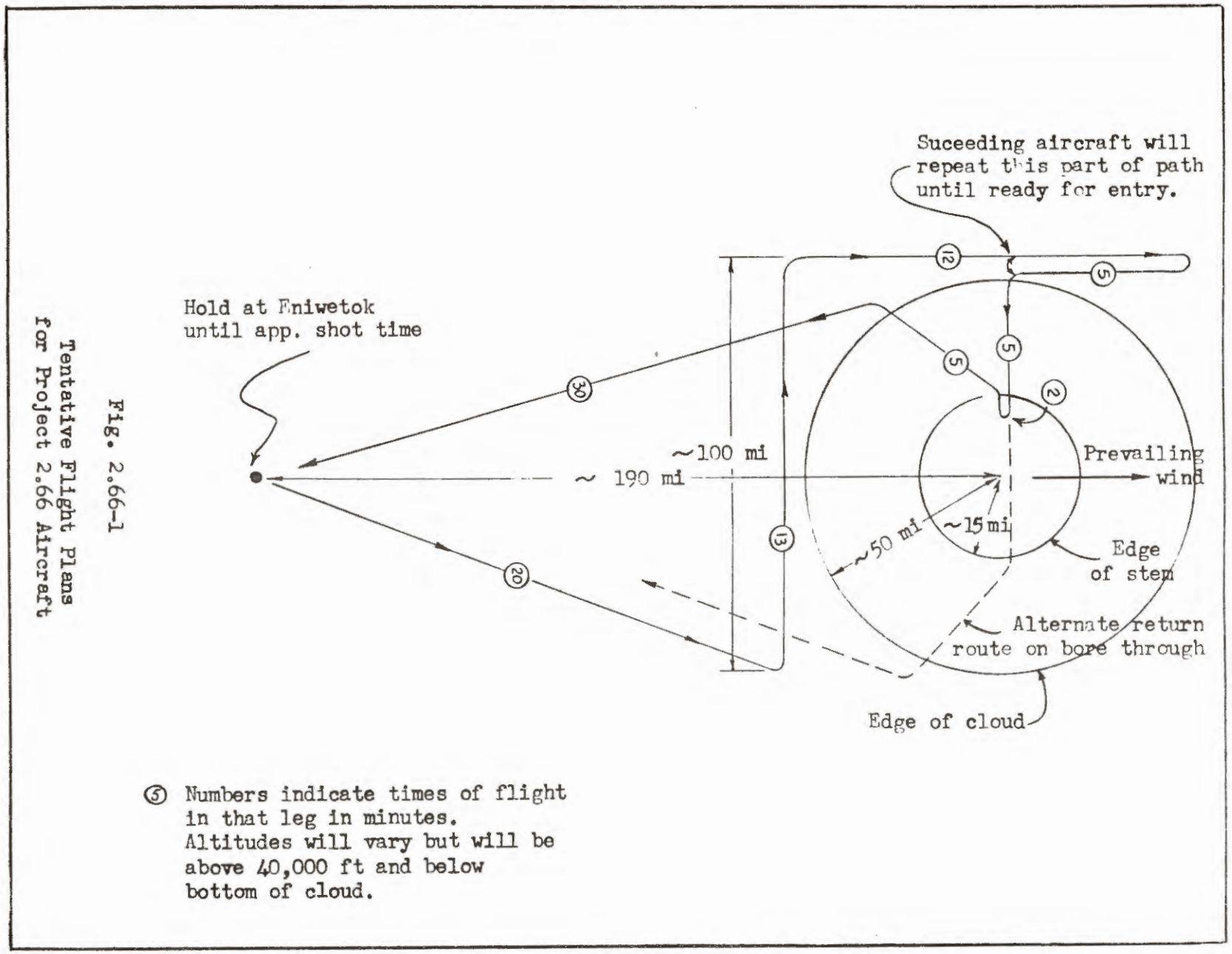

Fig. 2.66-1

Tentative Flight Plans for Project 2.66 Aircraft

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SECTION II

PROJECT DETAIL

PROJECT 2.7 TITLE: Ship Shielding Studies

AGENCY: NRDL

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO

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Objectives:

1. To determine the relative radiation dose rates contributed by contamination of the air envelope, water envelope, and the ship's weather surfaces.

2. To determine the time dependent gamma ray combined absorption and scattering coefficients of steel to be used in future calculations of shielding effectiveness.

3. To field test new and improved detector systems.

4. To obtain gamma radiation measurements at various points on and in the ship as a function of time for the following purposes:

a. Check points for future shielding calculations.

b. Determination of the radiological situation at various locations aboard ship for Projects 2.63 and 2.10, to be used for operational control of the test ships.

Description and Experimental Procedures:

1. Relative gamma radiation dose rates as a function of time from contamination resulting from CHEROKEE, ZUNI, FLATHEAD, and NAVAJO contributed by the air envelope, water envelope, and ships weather surfaces will be estimated by means of recording ionization chamber radiation detectors. Detectors will be located at several points on and inside the YAG's 39 and 40 as shown diagramatically in Figure 2.7-1. These consist of:

a. Two stations on weather deck shielded so as to receive radiation principally from the air. The residual reading on these stations may give some information on source accumulation.

b. One station in a well slightly below the keel, or in double bottom, receiving radiation from contaminated water passing under the ship.

c. One station (aft recorder room) looking at the water passing the side of the ship.

d. Stations on main deck to check the effects of the washdown system and measure the field in this area.

e. A station in Number 2 hold shielded so as to look down and receive radiation from water beneath the ship plus deck scatter.

2. Time dependent gamma radiation combined absorption and scattering coefficients for steel will be determined by means of recording detectors inside steel pipes having wall thicknesses ranging from 0.25 to 6.0 in. Each detector will consist of 3 packaged ionization chambers. The pipes with detectors and an unshielded detector will be enclosed in a thin aluminum dome so that the geometry of radiation sources will be identical.

3. A field test will be made of a prototype detector-recording system as a part of the laboratory's long range development. This prototype will operate beside standard instrumentation and will not be depended upon to supply data for the ship shielding studies. Results will be evaluated and presented as a USNRDL report.

4. Miscellaneous gamma radiation measurements will be made by means of unshielded recording radiation detectors located on the kingpost sampling platform, in the bridge, in the fireroom, in the recorder room, and in Number 2 hold. Pertinent detectors have parallel recorders located in the secondary control room.

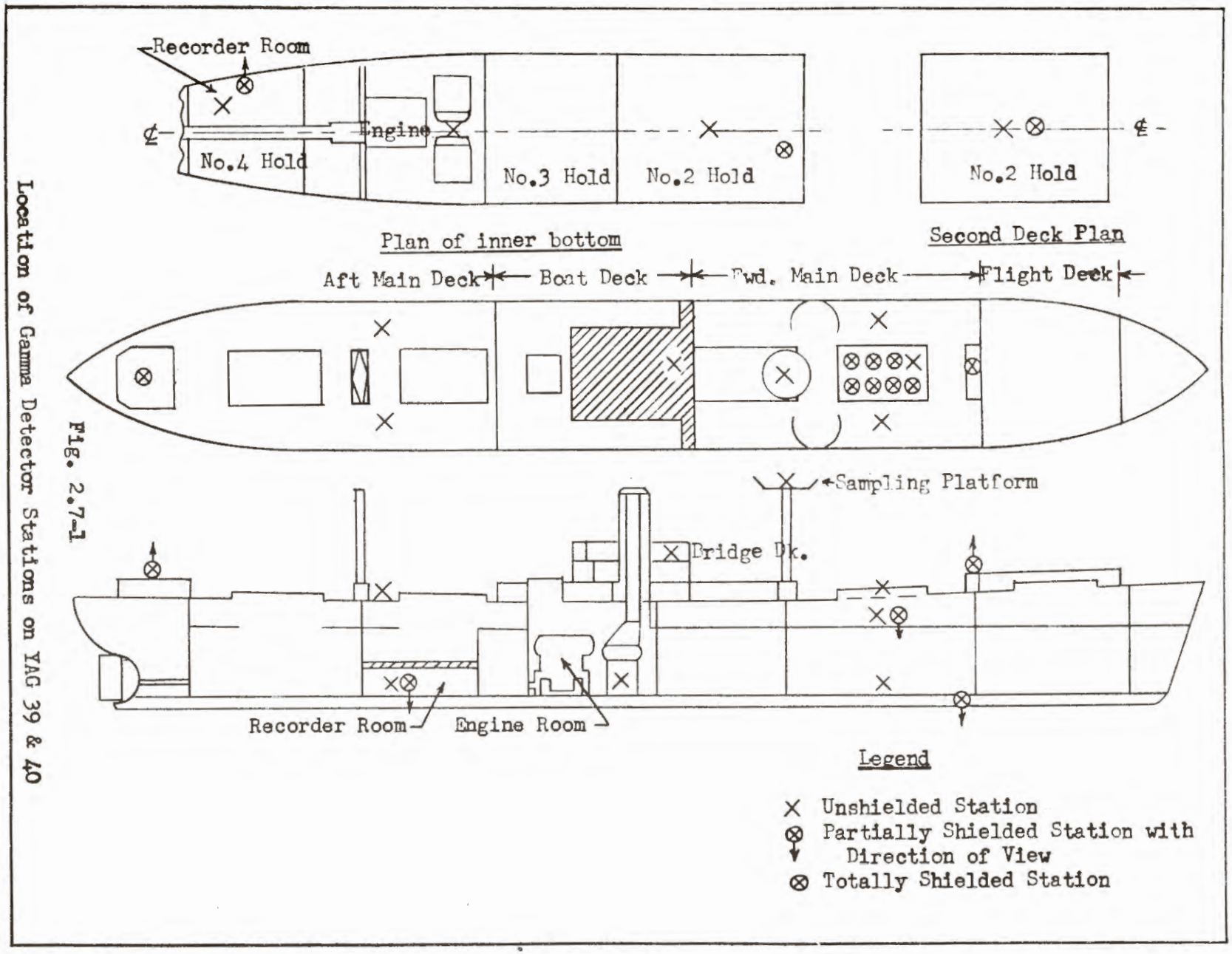


Fig. 2.7-1 Location of Gamma Detector Stations on YAG 39 & 40

SECTION II

PROJECT DETAIL

PROJECT - 2.8 TITLE: Shipboard Countermeasures Methods Studies

AGENCY: NRDL

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, TEWA } NAVAJO

Objectives:

To determine the relative effectiveness and cost of various proposed ship and personnel protection and reclamation methods.

Description and Experimental Procedures:

1. These studies are divided into 8 problems to be carried out on CHEROKEE and ZUNI. Seven of the studies will be carried out on the YAG-40 and the eighth one at the Rad-Safe Center on ELMER. The monitoring service to be provided for Projects 2.7, 2.9 and 2.10 by Problem G of 2.8; "Monitoring and Hazard Assessment Methods;" will also be available after FLATHEAD and NAVAJO. These problems involve the study of the effectiveness of various shipboard protective methods, decontamination methods, hazard assessment methods, personnel protection and decontamination methods, and basic contaminability-decontaminability studies.

2. Experimental problems follow:

a. Removable Radiological Protective Coating

b. Chemical Paint Stripping

(1) Both (a) and (b) will be carried out in same area on YAG-40 (see Fig. 2.8-1) because both are involved in the evaluation of the theory of step wise paint removal decontamination. The RRPC will be removed first followed by the base paint.

(2) Development work is in progress to formulate a hot water sensitive coating removable by a high pressure stream of hot water.

(3) Application and removal zones are shown in Fig. 2.8-1.

c. Mechanical Scrubbing Methods.

This study will evaluate the advantages and disadvantages of mechanical brush decontamination and will involve comparisons between manual

and mechanical scrub brushes in relation to rates, efficiency, effort required, personnel fatigue and morale. The ventilation deck house area on the main deck of the YAG-40 has been selected for the tests.

d. Protection of Miscellaneous Shipboard Materials and Equipment.

This study is planned to obtain preliminary information on the comparative contaminability and decontaminability of:

(1) Standard canvas vs a plastic fabric substitute

(2) Standard wire rope vs plastic coated wire rope

(3) Standard linen airlined fire hose vs rubber jacketed and protective coated linen firehose

e. Methods of Reducing Radiation from Contaminated Wood Decks:

(1) This is primarily a study of the contamination-decontamination problem of ships' wood decking.

(2) Weathered decking samples, 1 ft sq, representing a variety of existing and experimental ship deckings, will be exposed to radioactive fall-out. The distribution of the radioactive contamination over the sample surface, penetration into the sample, and beta and gamma radiation field intensity will be determined. Samples will be decontaminated in various ways, then radioactive contamination will again be determined. Samples shall be exposed on YAG-40 and processed at ELMER.

f. Skin Decontamination and Protection Methods:

(1) Determine the effectiveness of one waterless type hand cleaner.

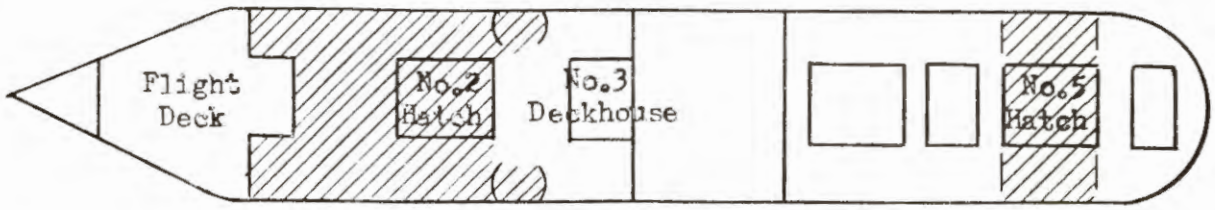
(2) Determine the effectiveness of one barrier cream in facilitating contamination removal.

(3) Test will be conducted in conjunction with regular Rad-Safe procedures on decontamination crews and technical personnel connected with decontamination operations.

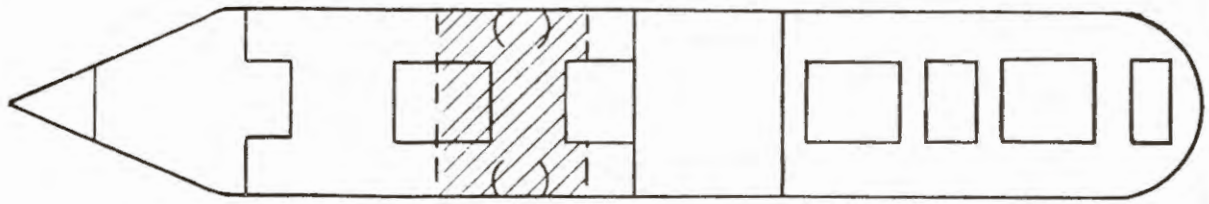
g. Monitoring and Hazard Assessment Methods:

h. Basic Contaminability-Decontaminability Studies:

(1) In conjunction with basic laboratory program to provide results for comparison with laboratory data, 72 test plates will be exposed on the YAG-40 to contaminating events for 10 minutes, 100 minutes, and for the full duration of the fall-out.



Steps 1 & 2 Application and Removal of RRPC



Steps 3 & 4 Application of Caustic Paint Stripper
and Removal of Standard Navy Gray Paint

Fig. 2.8-1

Protective Coating and Chemical Paint Stripping Areas on YAG-40

SECTION II

PROJECT DETAIL

PROJECT 2.9 TITLE: Standard Recovery Procedure for Tactical Decontamination of Ships

AGENCY: BUSHIPS

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, TENA

Objectives:

To proof test a decontamination procedure for ships and equipment consisting of firehosing, handscrubbing with detergent, and a second firehosing.

Description and Experimental Procedures:

The YAG's and LST stationed in the fall-out area will be subjected to the decontamination procedure upon their return to base at ELMER Island. The effectiveness of the decontamination will be repeatedly checked by radiological surveys. The major study will be made aboard the YAG-39 after the first contaminating event.

SECTION II

PROJECT DETAIL

PROJECT 2.10 TITLE: Verification of Washdown Effectiveness as a Ship-board Radiological Countermeasure

AGENCY: NRDL, BuShips

PARTICIPATION: CHEROKEE, ZUNI, FLATHEAD, NAVAJO, TEWA

Objectives:

1. Operations of YAG's and LST to be stationed in fall-out area.

2. Rad-Safe support for NRDL projects.

3. Washdown evaluation.

Description and Experimental Procedures:

1. This project will document the procedures involved with the deployment and turn-about operations of the YAG's and LST. It will also report on the effectiveness of the washdown systems.

2. The operational arrangements for the YAG's and the LST are indicated on Figs. 2.10-1 and 2.10-2 respectively.

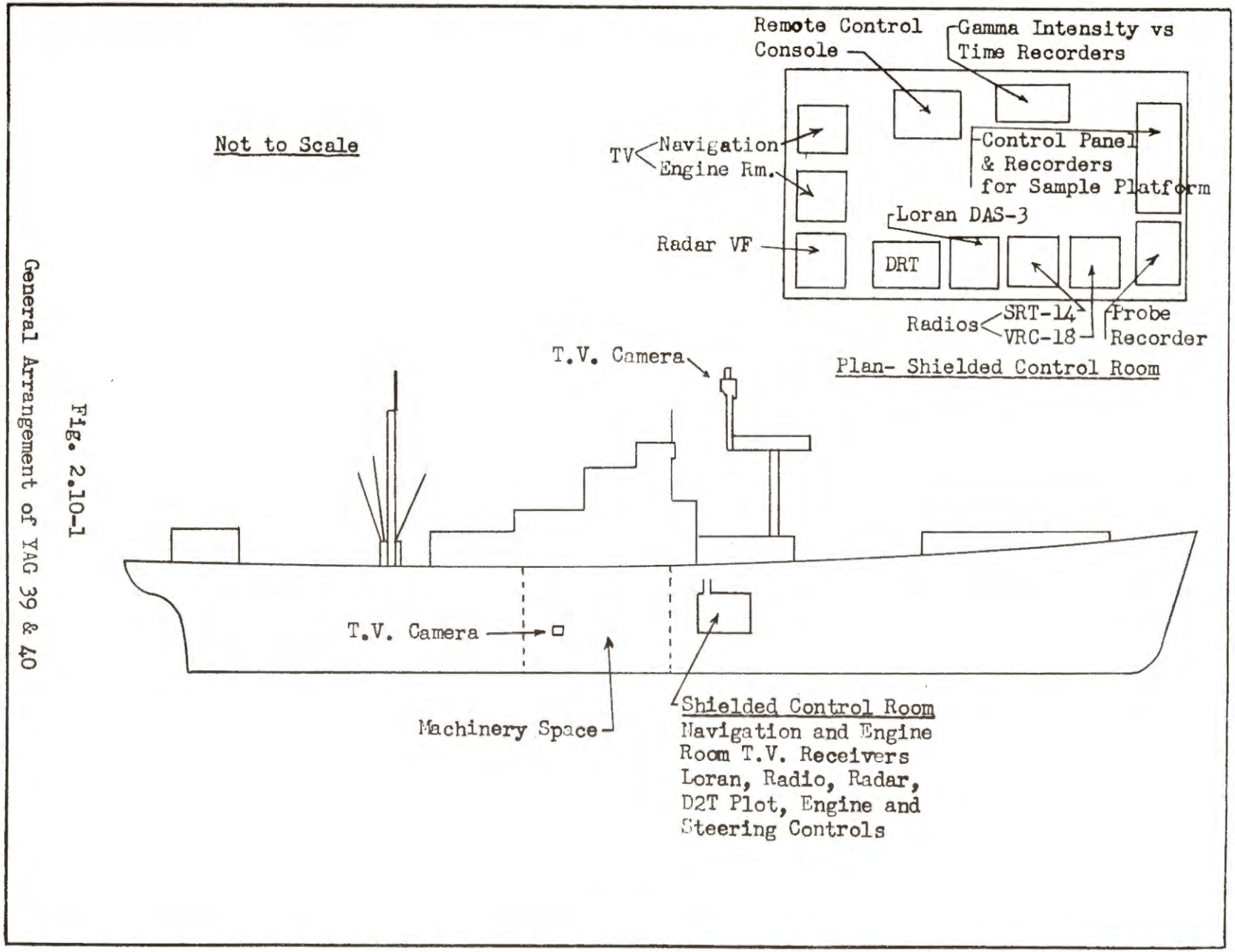


Fig. 2.10-1 General Arrangement of YAG 39 & 40

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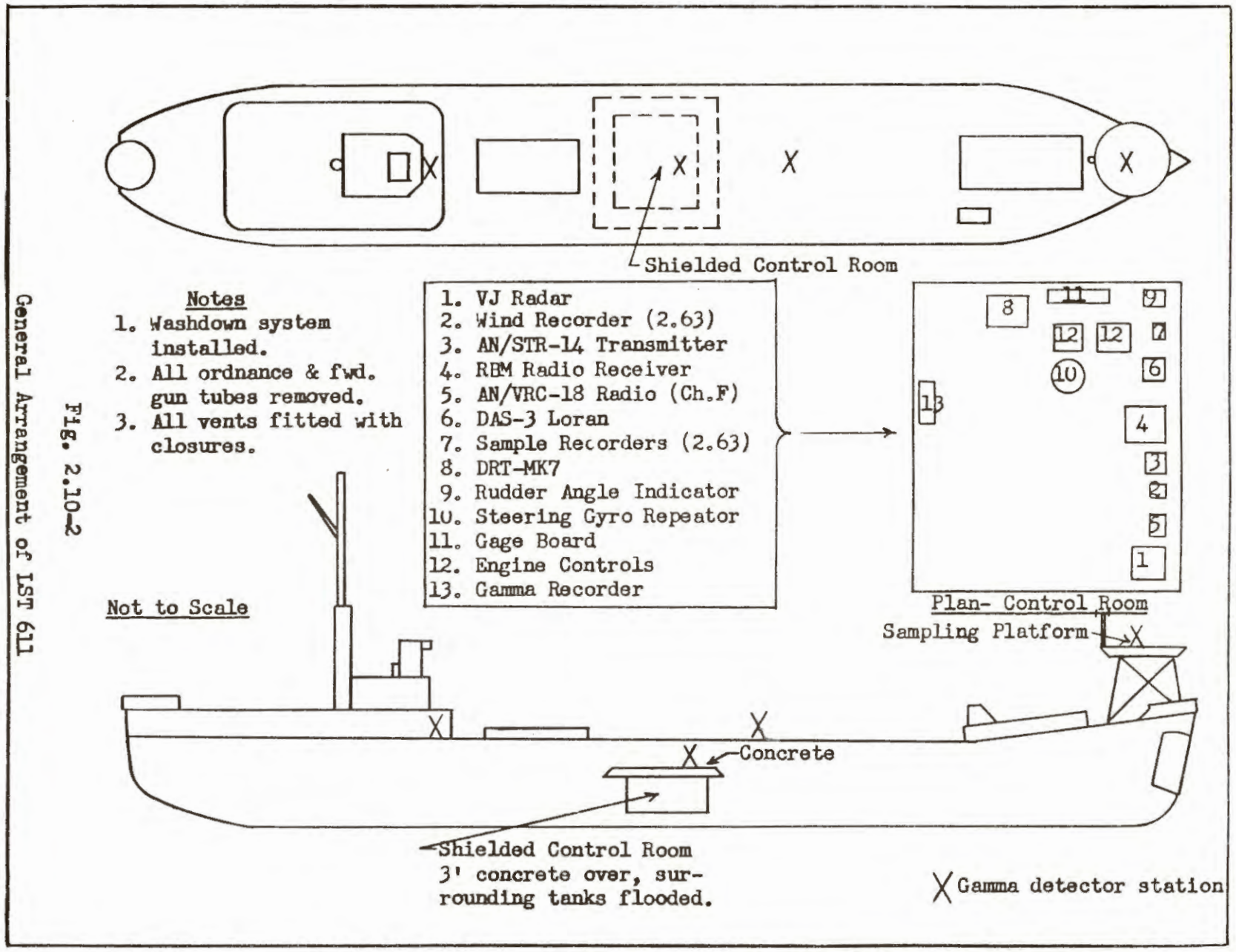

Fig. 2.10-2 General Arrangement of LST 611

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PART III
SHOT SCHEDULE

SECTION III

SHOT SCHEDULE

Shot	Date	Agency	Yield#			Island**	Type
			A	B	C		
LACROSSE	1 May	LASL	25-50KT	60KT	60KT	E- off YVONNE	Surface (Man made island)
CHEROKEE	1 May	LASL				B-CHARLIE	5,000'HB Air drop
ZUNI	15 May	UCRL	1-3MT	5MT	5MT	B-TARE	Surface
ERIE	23 May	LASL				E-YVONNE	300'Twr.
SEMINOLE	28 May	LASL				E-IRENE	Surface
YUMA	1 Jun	UCRL				E-SALLY	200'Twr.
FLATHEAD	2 Jun	LASL				B-off DOG	Barge
BLACKFOOT	7 Jun	LASL				E-YVONNE	200'Twr.
INCA	8 Jun	UCRL				E-PEARL	200'Twr.
HURON	12 Jun	LASL				B-Off DOG	Barge
OSAGE	14 Jun	LASL				E-YVONNE	700'HB Air drop
KICKAPOO	18 Jun	UCRL				E-SALLY	300'Twr.
NAVAJO	18 Jun	LASL				B-off DOG	Barge
MOHAWK	1 Jul	UCRL				E-RUBY	300'Twr
APACHE	1 Jul	UCRL				B-off DOG	Barge
TEWA	7 Jul	UCRL	6-8MT	10MT	15MT	B-off DOG	Barge
PAWNEE*		LASL				E-JANET	300'Twr.

* May be fired depending on performance of LACROSSE

\# Yield Designations

A - Expected range
B - Reasonable upper limit
C - Air safety limit

** Atoll
E - Eniwetok
B - Bikini

PART IV
SHOT PARTICIPATION

SECTION IV - A

PROJECT SHOT PARTICIPATION

PROJECT	AGENCY	LACROSSE	CHEROKEE	ZUNI	ERIE	SEMINOLE	YUMA	FLATHEAD	BLACKFOOT	INCA	HURON	OSAGE	KICKAPOO	NAVAJO	MOHAWK	APACHE	TEWA
2.1	ESL		A-P	A-P				A-P			B-Q			A-P		B-Q	
2.2	ESL		A-P	A-P				A-P			B-Q			A-P		B-Q	
2.4	CWL		P	P				Q						Q			
2.51	CWL		P				P		P				P				
2.52	SC		P														
2.61	NRDL		A	A				B*			B*			A			B*
2.62	SIO		A	A				A						A		B	A
2.63	NRDL		A	A				A						A			A
2.64	NYOO		A	A		C		A						A-C	C	B	A
2.65	CWL		A	A				A						A			A
2.66	SWC		P	P				P						P		P	Q
2.7	NRDL		P	P				P						P			
2.8	NRDL		P	P				Q						Q			Q
2.9	BuShip		P	P				P						P			P
2.10	NRDL		A-P	A-P				A-P						A-P			A-P

A - Major fall-out program
B - Secondary fall-out program
C - Fall-out calibration
P - Other major participation
Q - Other participation

*FLATHEAD, HURON, and TEWA participation will depend on CHEROKEE results.

SECTION IV - B

BIKINI ATOLL PARTICIPATION BY STATION AND PROJECT

ISLAND	CHEROKEE	FLATHEAD	NAVAJO	HURON	APACHE	ZUNI	TEWA
ABLE	1,2,63*,65	1,63*,65	1,63*,65	1	1	1,63*,65	63*,65
BAKER							
CHARLIE	1,2,51,52	1,65	1,65	1	1	1,65	65
DOG	1,2,65	1,2,65	1,2	1,2	1,2	1,2,65	
EASY	1,2	1,2	1,2	1,2	1,2	1,2	
FOX	1,2,65	1,2,65	1,2,65	1,2	1,2	1,2,65	65
GEORGE	1,2,63*,65	1,2,63*,65	1,2,63*,65	1,2	1,2	1,2,63*,65	63*,65
HOW	1,2,61,63,65	1,2,61,63,65	1,2,61,63,65	1,2,61	1,2	1,2,61,63,65	61,63,65
ITEM							
JIG							
KING							
LOVE	1,63*,65	1,63*,65	1,2,63*,65	1,2	1,2	1,63*,65	63*,65
MIKE							
NAN	1,2,61,63*,65	1,2,61,63*,65	1,2,61,63*,65	1,2,61	1,2	1,61,63*,65	61,63*,65
OBOE	1,2,63*,65	1,2,63*,65	1,2,63*,65	1	1,2	1,2,63*,65	63*,65
PETER	1	1	1	1	1	1,2	
ROGER	1	1	1	1	1	1,2	
SUGAR	1	1	1	1	1	1	
TARE							
UNCLE	1,2,63*,65	1,2,63*,65	1,2,63*,65	1,2	1,2	1,63*,65	63*,65
VICTOR	1,65	1,65	1,65	1	1	1,65	65
WILLIAM	1,63*	1,63*	1,63*	1	1,2	1,2,63*	63*
YOKE	1,2,63*,65	1,2,63*,65	1,2.63*,65	1,2	1,2	1,2,63*,65	63*,65
ZEBRA	1,63*	1,63*	1,63*	1	1	1,63*	63*
ALFA	1	1	1,2	1,2	1	1,2	
BRAVO	1,65	1,65	1,65	1	1	1	65
COCA	1,65	1,65	1,65			1,65	65
BIKINI LAGOON	62,63	62,63	62,63	62	62	62,63	62,63
OCEAN AREA AROUND BIKINI	62,63	62,63	62,63		62	62,63	62,63

NOTE: 63* - only two island stations will be utilized for any given shot.
Prefix "2" and period are omitted in project designation, i.e., Project "2.63" is "63".

SECTION IV - B

ENIWETOK ATOLL PARTICIPATION BY STATION AND PROJECT

NOTE: Prefix "2" and period are omitted in project designation, i.e., Project "2.63" is "63".

ISLAND	BLACKFOOT	YUMA	KICKAPOO	LA CROSSE
ALICE				
BELLE				
CLARA				
DAISY				
EDNA				
FLORA				
GENE				
HELEN				
IRENE				
JANET				
KATE				
LUCY				
MARY				
NANCY				
OLIVE				
PEARL				
RUBY				
SALLY		51	51	
TILDA		51	51	
URSULA				
VERA				
WILMA				1, 65
YVONNE	51			
ZONA				
ALVIN				
BRUCE				1, 65
CLYDE				
DAVID				
ELMER				
FRED				
GLENN				
HENRY				
IRWIN				
JAMES				
KEITH				
LEROY				1, 65
MACK				1, 65

PART V
OPERATIONAL PLANS

SECTION V - A

PROGRAM II CONTROL CENTER

1. GENERAL

In order to achieve effective coordination of the overall fall-out effort, a Program Control Center will be established and operated under the direction of the Program Director. The projects involved in the Fall-out Program will be analyzing and characterizing fall-out over large areas utilizing methods of oceanographic survey, collection of particles, and aerial survey. In order to effectively conduct their studies the individual projects require certain information from the other participating projects as well as from other related test agencies. They further require close control of their test vehicles to insure that the areas of fall-out interest are properly explored and that discrepancies of measurement and position are resolved immediately. The establishment of the Control Center will serve to accomplish these ends.

2. LOCATION

The Program Control Center will be located aboard the U.S.S. ESTES (AGC-12). The Flag Message Center of this ship has been designated as the specific location for the Control Center. This space is being modified to meet the requirements of the program. The floor plan of the Control Center is shown in Fig. V-A-1.

3. PARTICIPATION

The projects participating in the operation of the Control Center are listed below with the times of interest and test vehicles to be controlled indicated:

2.62	D to D+5	USS McGINTY, USS SILVERSTEIN
	D to D+6	M/V HORIZON
2.63	D-1 to D+2	YAG-39, YAG-40, LST-611
2.64	H+6 until late D-day	Two P2V aircraft
	Daylight period D+1, D+2, D+4. If required D+3, D+5, D+6	Two P2V aircraft
2.65	As specified by Program Director	None. Project 2.65 will be represented by plotter personnel who will work for the Program Director.

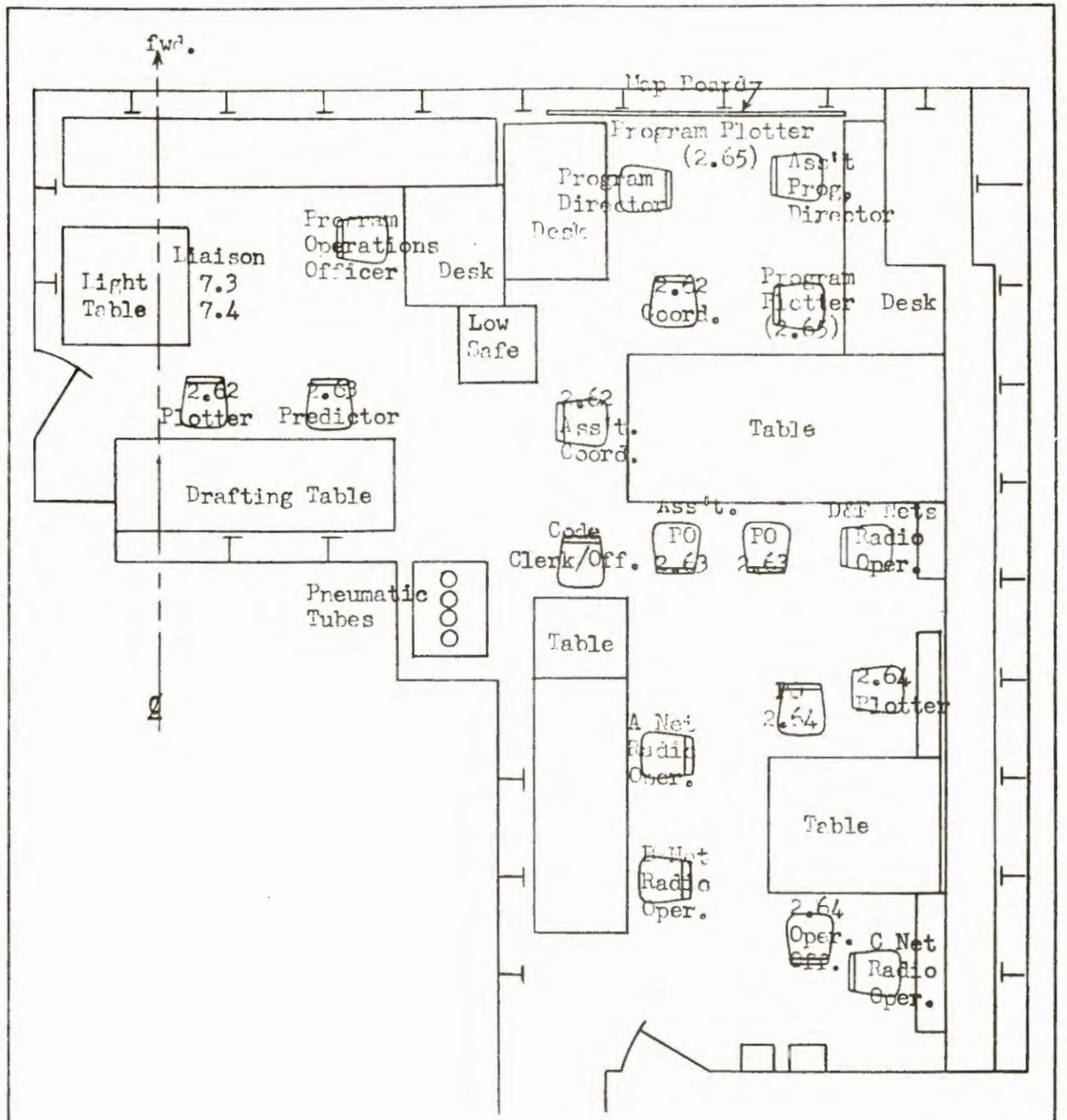

Fig. V-A-1

Program 2 Control Center Aboard USS Estes

4. SUPPORT BY NON-PROGRAM AGENCIES

To support the operation of the Fall-out Control Center, JTF Rad Safe will provide weather and fall-out prediction information. Provision has been made to include liaison personnel from TG 7.3 and 7.4 if these agencies desire representation.

5. PERSONNEL POSITIONS

To accomplish the missions of the program and its included projects, the following psoitions have been assigned to the Control Center organization. Personnel to be provided by JTF are indicated by an asterisk (*):

Position	Total Personnel	Duties	Equipment and Communications Facility
a. PROGRAM 2			
1 Program Director	1	Overall supervision of fall-out program	Desk
1 Ass't Program Director	1	Supervise situation plot	Desk
1 Situation Map Plotter	2	Maintain situation plot	Wall mounted plot board and desk. (Personnel provided by Proj. 2.65)
1 Operations Officer	1	General Coordination as required	Desk
1 Code Officer or Clerk	3	Encoding and decoding	Desk
b. PROJECT 2.62			
2 Project Coordinators	4	Reduction of project data. Direction of DE and HORIZON maneuvers	Channel "D". Ear phones and microphone.
1 Project Plotter	3*	Plotting of Project data	Plotting table.
1 Operator, radio	3*	Radio operation CW and voice	Channels "D" and "F" ear phones, microphone, key and desk.

Position	Total Personnel	Duties	Equipment and Communications Facility
c. PROJECT 2.63			
1 Project Officer	1	Coordinate technical data, make technical decisions, direct ships to positions, supervise project plots.	Channels "D" and "F"
1 Forecaster	2	Receives weather data, analyzes fall-out predictions. Relieves fall-out predictor	Works in weather office Receives weather and fall-out prediction data
1 Fall-out Predicator	1	Constructs predicted fall-out pattern, relays info to Project Officer for use	
1 Ass't to Project Officer	1	Transmits instructions to ships. Does on the spot analysis of data. Relieves Project Officer.	Channels "D" and "F"
d. PROJECT 2.64			
1 Project Officer	1	Coordinates technical data, makes technical decision, does data analysis, supervises project plots.	Channel "C"
1 Operations Officer	1	Receives telemeter data, analyzes data, and supervises plots	Channels "A" and "B"
1 Operator, radio	2*	Radio operator Channel "C", (one CW/voice and one voice operator)	Channel "C", ear phones, microphone, key, and desk.

Position	Total Personnel	Duties	Equipment and Communications Facility
PROJECT 2.64 (Cont'd)			
2 Operators, radio telemeter	4*	Receive radiation tapes, maintain receiver and recorder, marks time on tapes.	Channels "A" and "B", ear phones.
1 Plotter	2*	Maintain aerial operations plot. 1 Plotter to be used ashore between operations.	Wall mounted plot board

As indicated above there will be 18 program personnel on duty in the Control Center and one in the Weather Office. To man these positions a total of 33 persons will be required of which 14 are to be furnished by the Task Force.

6. COMMUNICATIONS

a. To fulfill the communications requirements of the projects participating in the fall-out program, the following radio nets will be established:

(1) Channel "A" Net - Project 2.64 telemetry channel.

(2) Channel "B" Net - Project 2.64 telemetry channel.

(3) Channel "C" Net - Project 2.64 aircraft navigational control channel.

(4) Channel "D" Net - Project 2.62 - 2.63 surface vessel control net.

(5) Channel "E" Net - Program UHF common net.

(6) Channel "F" Net - DOD Net No. 4.

b. Figure V-A-2 portrays the nets listed above and includes all stations assigned to the individual nets.

c. A simple code is being prepared for use, if required, by Projects 2.62 and 2.63 in the transmission of radiological information. Although no encoding is required for transmission of position data, it is anticipated that a reference point or map grid type code will be utilized in order to provide greater security.

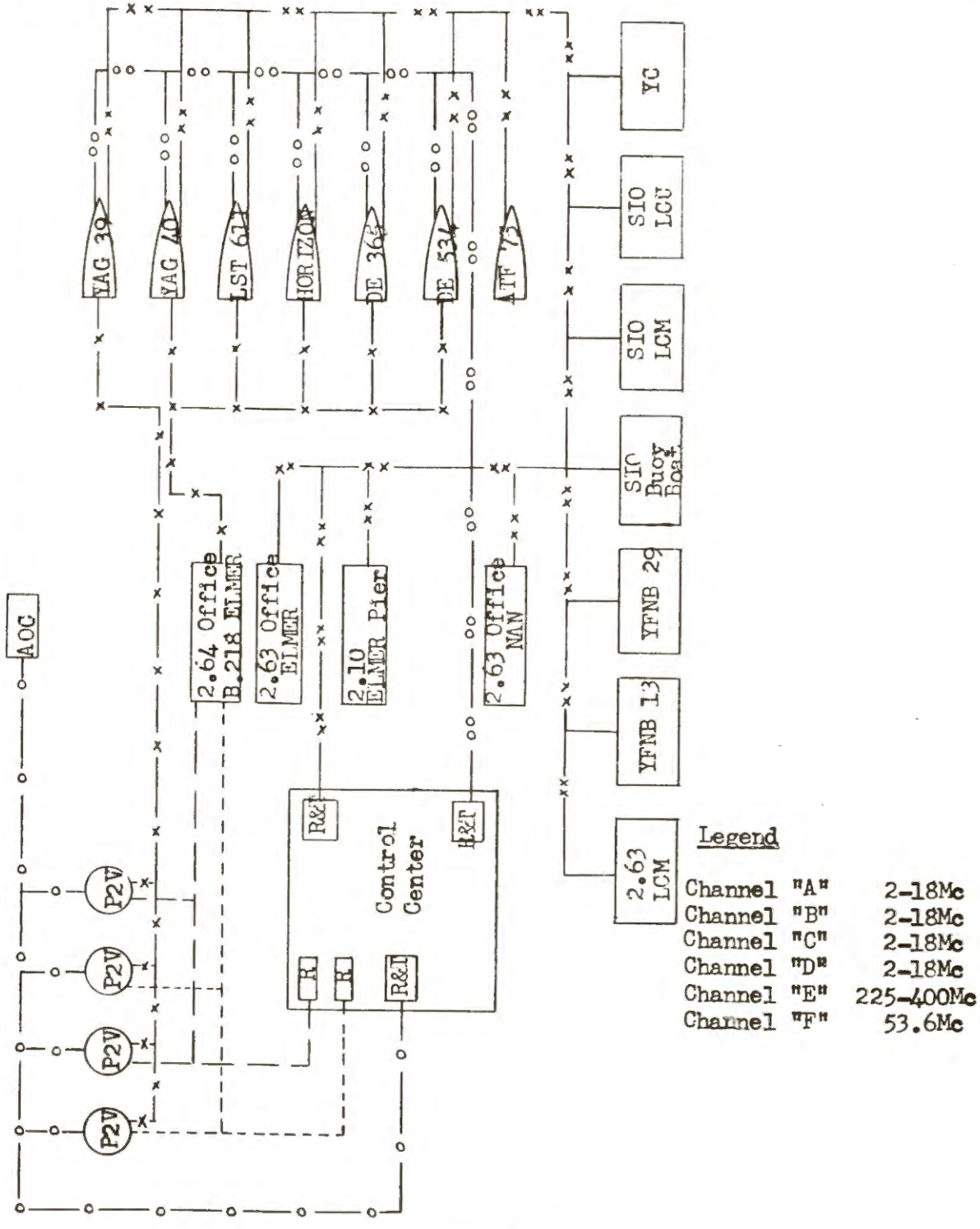

Fig. V-A-2

Program 2 Radio Channels

7. PLOTS

a. An overall situation plot will be kept by the Program. Project 2.65 plotters will maintain this plot under the supervision of the Assistant Program Director. To permit consistency of data shown on this plot, the following reference times have been selected:

Plot	Reference Time
D-day before 1200	H+12
D-day after 1200	H+24
D+1	H+48
D+2	H+72
etc.	

All data submitted to the Program for inclusion in the situation plot will be referred to these times. It is expected that a $t^{-1.2}$ decay factor will be utilized for the CHEROKEE event. For later events an improved factor will be determined, based on experience gained from the CHEROKEE participation.

b. Plotting Charts (Latitude and longitude coordinates will be used for all plotting charts).

(1) A close-in plotting chart for the Control Center operations will be provided by Project 2.63. This chart will cover 360°. Barge, raft, skiff, and land fall-out stations will be placed on the chart prior to each event.

(2) A distant plotting chart for Control Center operations will be provided by Project 2.62. This chart will have a 180° coverage and will include the areas in which distant fall-out is expected.

(3) Aerial plot charts for the Control Center will be provided by Project 2.64.

8. DRY RUN

The Program Control Center will participate in a dry run approximately two weeks prior to the first event. The purpose of this dry run is to check out the communications and operational effectiveness of the Control Center.

9. WEATHER OBSERVATIONS

The JTF pre-shot weather observations and late planning meetings which are of interest to the program operations are tentatively scheduled as follows:

D-1

0300 hrs	Complete weather observation.
0800 hrs	Synoptic charts available based on 0300 data.
0900 hrs	Wind observations.
1100 hrs	Planning briefing meeting. Preliminary firing decision.
1500 hrs	Complete weather observation.
2000 hrs	Synoptic charts available based on 1500 data.
2100 hrs	Wind observations.
2300 hrs	Weather briefing. Probably final firing decision. Complete fall-out prediction based on "reasonable upper limit" yield, and wind predications from 1500 and 2100 observations.

D-day 0300 hrs	Complete weather observation.
H hr	Further wind observations.
H+4	Possibly late fall-out prediction based on preliminary observed yield, cloud dimensions and H-hr winds.

10. CONCLUSION

All projects participating in the Control Center will be responsible for furnishing all supplies required for their operation. Project officers are responsible for the organization of their personnel so as to insure that their sections are properly manned during the times of project interest. The Program Operations Officer will maintain contact with JTF and ship's representatives to insure that JTF provided personnel are available when required.

SECTION V - B

SHIP, BOAT, AND AIRCRAFT MOVEMENTS

PROJECT	CRAFT	DEPARTURE FROM	DEPARTURE DATE	ARRIVAL AT	ARRIVAL DATE
Program 2	USS ESTES (AGC-12) (Control Center)	Port Chicago	26 Mar	ELMER	10 Apr
2.61	USS KNUDSON (APD-101)	San Diego	26 Mar	ELMER	10 Apr
	USS CURTIS (AV-4)	Port Chicago	26 Mar	ELMER	10 Apr
	(Rockets)				
2.62	M/V HORIZON	San Diego	5 Mar	ELMER	24 Mar
	USS McGINTY (DE-365)	Pearl Harbor	2 Apr	ELMER	10 Apr
	USS SILVERSTEIN (DE-534)	Pearl Harbor	2 Apr	ELMER	10 Apr
	(Buoy boat and skiffs will be aboard YFNB's)				
2.63	YAG 39	San Francisco	8 Mar	ELMER	8 Apr
	YAG 40	San Francisco	8 Mar	ELMER	8 Apr
	YFNB 13 (towed by SIOUX)	San Francisco	23 Feb	PPG	20 Mar
	YFNB 29 (towed by SIOUX)	San Francisco	23 Feb	PPG	20 Mar
	USS SIOUX (ATF-75)	San Diego	20 Feb	San Francisco	23 Feb
		San Francisco	23 Feb	NAN	20 Mar
	USS CROOK COUNTY (LST-611)	San Francisco	11 Feb	ELMER	8 Apr
	YC-1420	Pearl		NAN	10 Apr
	(Package samples; COMSERVPAC tow)				
	(3 pontoon rafts from San Francisco will be aboard YFNB's)				
2.64	4 P2V aircraft Nos 131453, 131457 131463, 128412	Whidbey NAS	5 Apr	Kwajalein	15 Apr
2.66	6 B57B aircraft Nos 521513 521545 521552 521508 521527 521531	McClellan AFB California	6-7 Apr Ready Date	FRED via Hickam Field	10-11 Apr
	(Departure depends on winds. Trip estimated 3-4 days)				

SECTION V - C

PROJECT 2.1 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE	D-2		Install emulsions in previously prepared exposure stations; 6 men, 2 DUKW's, 2 LCM's.
do	H+1 min		Automatic dropping mechanism operates on some emulsions.
CHEROKEE	H+24 to H+36	1 hr	Recover emulsions from ABLE and CHARLIE; 3 men in helicopter or DUKW or LCU
ZUNI	do	do	Recover emulsions from OBOE, PETER, ROGER, and UNCLE; 3 men in helicopter or DUKW on LCU
FLATHEAD NAVAJO APACHE	do	do	Recover emulsions from DOG, EASY, FOX, and GEORGE; 3 men in helicopter or DUKW on LCU
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE	After recovery		Fly emulsions to RadSafe Laboratory at ELMER for development.
do	D+2		Recover remaining emulsions and detectors and fly to RadSafe laboratory at ELMER for development.

SECTION V - C

PROJECT 2.2 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI FLATHEAD HURON NAVAJO APACHE	D-2	2 hrs per station	Install and activate residual detectors. Install initial gamma detectors; 6 men, 2 DUKW's, 2 LCM's (or 2 LCU's)
CHEROKEE	H-15 min and H-15 sec		Timing signals at stations on ABLE and CHARLIE to activate initial gamma recorders.
FLATHEAD HURON NAVAJO APACHE	H-1 min and H-1 sec		Timing signals at stations on DOG, EASY, FOX, GEORGE, DOG bunker and GEORGE bunker to activate initial gamma recorders.
ZUNI	H-1 min and H-1 sec		Signal at stations on PETER, ROGER, and OBOE to activate initial gamma recorders.
CHEROKEE HURON FLATHEAD NAVAJO APACHE	As soon as possible after H+36	5 min per station	Recover data from recorders at ABLE, CHARLIE, DOG, EASY, FOX, GEORGE, HOW, LOVE, NAN, GEORGE bunker, DOG bunker, ALFA, WILLIAM, and YOKE; 6 men, 2 DUKW's and 2 LCM's or 2 helicopters.
ZUNI	As soon as possible after H+36	10 min per station	Recover data from recorders at DOG, EASY, FOX, GEORGE, HOW, OBOE, PETER, ROGER, LOVE, NAN, WILLIAM, ALFA, YOKE; 6 men, 2 DUKW's and 2 LCM's or 2 helicopters.

SECTION V - C

PROJECT 2.4 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI FLATHEAD NAVAJO	D-3	4 hrs	Transfer one panel and frame assembly each to YAG 39 and 40 from ELMER decontamination area. Assisted by Holmes & Narver truck crane, flat-bed semi, and long boom crane on LCU.
do	H+12		Affix canvas covers over panels - shipboard personnel
do	D+1	2 hrs	Transfer panel and frame assembly from YAG 40 to ELMER decontamination area. Demount panels and commence decontamination tests. Assisted by Holmes & Narver truck crane, flat-bed semi, and long boom crane on LCU.
do	D+3	2 hrs	Transfer panel and frame assembly from YAG 39 to ELMER decontamination area. Demount panels and commence decontamination tests. Same equipment as above.

NOTE: Refer to Project 2.10 Operations for YAG deployments.

SECTION V - C

PROJECT 2.51 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE	D-10	2 hr	Recovery dry run; 5 Proj 2.52 plus 6 Proj 2.51 men, 1 helicopter. Coordinated with Proj 2.52. (Train each recovery team in turn.
do	D-12		Install steel base plates on CHARLIE Island. 4 project personnel and 2 Holmes & Narver personnel. LCM and DUKW with an A frame or monorail hoist.
do	D-4	24 hrs	Install neutron detectors; 5 men, 1 DUKW, 1 LCM.
do	H+9	1 hr	Recover detectors from station on reef off CHARLIE. 5 persons, DUKW and LCM. LCM to transport samples to NAN.
do	H+9	1 hr	Recover detectors from 3 stations on CHARLIE. (Coordinated with Proj 2.52); 6 men plus 6 men from Proj 2.52, 3 helicopters; or 2 men plus 2 men from Proj 2.52, 1 helicopter if radiological situation permits.
do	H+10		Deliver detectors to NAN by helicopter; fly detector to counting laboratory on NAN by fixed wing aircraft.
BLACKFOOT	Prior to D-1		Install neutron detectors (coordinated with Proj 12.1); 5 men, DUKW, LCM.
do	D-1		Instrument concrete boxes; 5 men, LCM and DUKW with monorail hoist.
do	H+8	2 hrs	Recover detectors; 5 men, DUKW, LCM (coordinated with Project 12.1).
do	H+12	2 hrs	Recover detectors from concrete boxes; 5 men, LCM and DUKW with A frame or monorail hoist.
do	H+10		Transport detectors from YVONNE to counting laboratory on ELMER by helicopter.
YUMA KICKAPOO	Prior to D-1		Install detectors at SALLY; 5 men, DUKW, LCM. Helicopter (YUMA only) for personnel return.
YUMA	H+3	2 hrs	Recover detectors on stake stations. Drag cable line to safe area by tractor and remove detectors; 5 man, DUKW, 2 LCM's and D-7 tractor. Helicopter (YUMA only) for personnel entry.
KICKAPOO	H+8		
YUMA	H+5		Transport detectors to counting laboratory on ELMER by helicopter.
KICKAPOO	H+10		

SECTION V - C

PROJECT 2.52 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE	D-10	2 hrs	Recovery dry run; 6 men plus 6 men from Proj 2.51, 3 helicopters (coordinated with Proj 2.51).
do	D-12	4 hrs	Install sample containers; 3 men, LCM, 3/4 ton truck on CHARLIE.
do	H+6	½ hr	3 men go by helicopter from carrier to station 102, OBOE, for instrument warm-up and calibration.
do	H+9	½ hr	Recover samples; 6 man plus 6 Proj 2.51 men, 3 helicopters (coordinated with Proj 2.51); or 2 men plus 2 men from Proj 2.51, 1 helicopter if radiological situation permits.
do	H+10		Deliver samples to Station 102, OBOE, by helicopter. Commence counting.

NOTE: A Project 2.52 recovery crew consists of a Sandia Corp. and a Holmes & Narver man.

SECTION V - C

PROJECT 2.61 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE	D-35	30 days	Install launchers. Perform test firings at 180° to direction of flight for the actual events.
CHEROKEE ZUNI HURON FLATHEAD NAVAJO TEWA	H-24	6 hrs	Make final azimuth and elevation adjustments of launchers; 5 men, LCM or helicopter.
do	H+5 min	20 min	Rockets launched by local timer. Receive telemetered data aboard USS KNUDSON and in Bldg. 70 on NAN Island.

SECTION V - C

PROJECT 2.62 OPERATIONS

NOTE: Refer to Project 2.10 for YAG and LST operations.

EVENT	TIME		OPERATION
	BEGIN	DURATION	
	25 Mar	5 wks	M/V HORIZON performs oceanographic survey around Bikini Atoll. Navy LCU with equipment trailer aboard performs survey of Bikini Lagoon.
	Early Apr	Until first event	USS SIOUX installs deep moored skiffs under direction of 3 Proj 2.62 personnel.
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	H-hr		DE's and M/V HORIZON stationed at Task Force staging area outside fall-out area.
do	H+3	2 - 5 days	DE's commence survey of fall-out area.
do	H+3	7 hrs (approx)	M/V HORIZON commences survey of fall-out area and proceeds to relieve YAG 39. (EXCEPT FOR APACHE).
CHEROKEE FLATHEAD NAVAJO APACHE	As soon as possible Est. H+10	Until next evacuation	Survey of Bikini Lagoon by LCU; 3 men.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Est. H+23	6 days (approx)	On being relieved by YAG 39, M/V HORIZON continues survey of fall-out area, especially areas marked by DE's.
ZUNI TEWA	ASAP, est. H+26	Until next evacuation	Post shot survey of Bikini Lagoon by LCU; 3 men.
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	When radiation level permits	5 - 10 days	Recover records and service skiffs; 3 men on ATF SIOUX.
ZUNI	D-5 to -7	1 day	Install 2 deep-moored skiffs upwind approx 10 mi from GZ.

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SECTION V - C

PROJECT 2.63 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
			NOTE: Refer to Project 2.10 Operations for YAG & LST deployments.
CHEROKEE	10 April	14 days	Tow YFNB barges into place in Bikini Lagoon. Emplace pontoon rafts in Bikini Lagoon. Place island stations, including transferring sampling platforms from YFNB 13 to HOW Island. Perform deep sea mooring of skiffs outside Bikini Atoll using ATF. (2.62)
CHEROKEE ZUNI FLATHEAD NAVAJO* TEWA*	H-22	4 hrs	Final instrument arming on YFNB's, rafts, HOW and other two atoll islands. Use 2 LCM's.
do	ASAP Est. H+6	3 hrs	Recover samples from one YFNB and HOW Island: 1 team of 5 men, (Including RadSafe personnel) 1 helicopter.
do	ASAP Est. H+10	5 hrs (Atoll islands morning of D+1)	Recover remaining samples from YFNB's, pontoon rafts, and Atoll islands: (including RadSafe personnel) 2 LCM's w. 2 teams of 5 men each or 1 LCM & 1 helicopter.
do	D+3	4 days	Recover samples & data from skiffs and reset equipment using ATF.
			* YFNB's may not be placed in the lagoon for these events, depending on anticipated damage and contamination from previous shot.

SECTION V - C

PROJECT 2.64 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA APACHE	After fall-out; est. H+6	8 hrs	Initial aerial survey over contaminated areas without penetration into areas of active fall-out; 2 P2V's. Aircraft No. 3 & No. 4 (if available) On ZUNI the survey near the atoll will include at least one pass over the crater with one airplane.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Est. H+8		Aircraft No. 3 surveys over YAG 39 and 40 positions for correlation.
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	D+1	10 hrs	Survey of contaminated areas out to end of isodose plot (150 - 300 mi); aircraft Nos. 3 and 4.
do	D+2 & D+4; possibly D+3, D+5, D+6	10 hrs	Resurvey of contaminated areas using two different aircraft (Nos. 1 and 2).
SEMINOLE MOHAWK	D		Use portable gamma spectrometer aboard helicopter to evaluate absorption by air.
NAVAJO	D+1		Use portable gamma spectrometer aboard helicopter to evaluate absorption by air.

NOTE: Refer to Project 2.10 Operations for YAG operations.

SECTION V - C

PROJECT 2.65 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA LACROSSE	D-6	5 days	Install equipment and sampling surfaces at all stations.
ZUNI LACROSSE	H+4 to H+6	1 hr	Aerial survey of islands near crater; probes on long cables below 2 helicopters; 6 men.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	D, D+1, & D+3	6 hrs	Radiological aerial survey over atoll; 2 helicopters; 6 men.
do	As soon as possible Est. H+6		Recover sample from HOW and LOVE in conjunction with Proj 2.63 helicopter flight; 1 man.
do	As soon as possible Est. H+8	15 min per station	Recover sample from 1 or 2 islands by LCM.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA LACROSSE	H+26	10 min per station	Recover samples from all island stations; 3 men, 1 helicopter.
do	On arrival of ships at NAN & ELMER		Recover collectors from YAG's and LST 611.
do	D+3		Recover collectors from Rongerik Atoll if any fall-out has been collected. Scheduled acft. to Rongerik; 2 men.

NOTE: Refer to Project 2.10 Operations for YAG and LST operations.

SECTION V - C

PROJECT 2.66 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	H+1 hr. Earlier on later shots to H+35 min	1 hr	Enter area of GZ at about H+25 min and survey cloud for size and height before aircraft commence to penetrate stem and cloud, performing radiological and turbulence surveys.
do	After penetration.		Return to FRED for data recovery and residual contamination survey.

SECTION V - C

PROJECT 2.7 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE ZUNI FLATHEAD NAVAJO	D-1		All but one man per YAG transfer to hotel ship.
do	H		Project man starts recorders on YAG's.
do	On return of YAG's to ELMER		Remove records for analysis. Repair and check instruments.

NOTE: Refer to Project 2.10 Operations for YAG operations.

SECTION V - C

PROJECT 2.8 OPERATIONS

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI	D+15		Apply hot water sensitive coatings to areas on YAG 40.
do	After return of YAG 40 to ELMER		Commence decontamination tests and operations

NOTE: Refer to Project 2.10 Operations for YAG operations.

SECTION V - C

PROJECT 2.9 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	D+2	7 days	Commence radiological survey. Begin decontamination procedures aboard YAG's.

NOTE: Refer to Project 2.10 Operations for YAG operations.

PROJECT 2.10 OPERATIONS

EVENT	TIME BEGIN	TIME DURATION	OPERATION
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	D-1		Remove excess crew and Project personnel from YAG's and IST and transfer to hotel ship. Transport by ICM.
do	Est. H-16	Est. 17 hrs	IST 611 leaves staging area and proceeds to station in fall-out area.
do	Est. H-12	5 to 10 hrs	YAG 39 and YAG 40 leave staging area and proceed to respective stations in fall-out area.
do	Est. H-7		YAG 40 approaches sampling location.
do	Est. H-2		YAG 39 approaches sampling location.
do	Est. H+1		IST 611 approaches sampling location.
do	4 hrs after cessation of fall-out Est. H+10	Est. 20 hrs	YAG 40 proceeds to EIMER.
do	Est. H+10	Est. 8 hrs	YAG 39 relieved by M/V HORIZON and proceeds to MAN.
do	Est. H+18	Est. 10 hrs	YAG 39 arrives at MAN, drops samples, assumes new crew and proceeds back to relieve M/V HORIZON.
do	Est. H+28		YAG 39 relieves M/V HORIZON.
do	Est. H 20	Est.12 hrs	Excess crew transfer from Bikini(Continued on next page) to Eniwetok via TF transport.

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SECTION V - C

PROJECT 2.10 OPERATIONS (Cont'd)

EVENT	TIME		OPERATION
	BEGIN	DURATION	
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	3 hrs after cessation of fall-out Est. H+20	Est. 35 hrs	LST 611 proceeds to ELMER.
do	Est. H+30		YAG 40 arrives at ELMER.
do	Est. H+55		LST 611 arrives at ELMER.
do	Est. H+60		YAG 39 leaves station in fall-out area and proceeds to ELMER.
do	Est. H+80		YAG 39 arrives at ELMER.

PART VI
REQUIREMENTS

SECTION VI - A

OFFICE, LABORATORY, WORK SPACE, AND OFFICE EQUIPMENT

1. OFFICE, LABORATORY, AND WORK SPACE.

Table VI-A-1 shows a tabulation of the office, laboratory, and work space tentatively assigned to the projects. As a result of the project review and correction of the first edition, many changes have been indicated. It is noted that although these changes are advantageous to the projects, their lateness of submission makes many of them impossible to realize. The projects should base their operations on the spaces indicated in this section, however it must be remembered that this represents a tentative assignment only and therefore a maximum degree of flexibility must be maintained.

Figures VI-A-1 and VI-A-2 give the layouts of the EIMER and NAN Compounds. Figure VI-A-3 presents the floor plans of the various types of tents assigned to the projects. Figures VI-A-4 and VI-A-5 gives some NAN Island project installations located outside the compound.

2. FURNITURE AND OFFICE EQUIPMENT.

Table VI-A-2 is a tabulation of the furniture and office equipment of the projects, and includes telephone facilities. It is noted that this is a summary of requirements, and no assurance has been given that all requirements will be met. Since furniture and equipment was procured and shipped based on early project reports, there can be no assurance that the increased requirements resulting from the project review of the first edition will be met. In the case of telephones, it has already become obvious that requirements cannot be met. The project officers will have to fit their project operations to best utilize the facilities which will be made available to them.

TABLE VI-A-1

OFFICE, LABORATORY, AND WORK SPACE

PROJ	LOCATION	SPACE ASSIGNED			REMARKS
		SIZE/FT	TYPE	AREA	
2.1	ELMER	16x32	Office, Lab, and Storage Tent (B-2)	Compound	Installed tent fly required. Good lighting work benches, 110v AC outlets.
	ELMER	31x 9	Trailer Space	Calibration Range	115v, 60 cycle, 3 phase power
	ELMER		Calibration Range		Existing Range
	NAN	14x14	Tent #13(A-3)	Compound	Lights
	TARE	14x14	Tent (A-3)		Lights
	FOX	14x14	Tent (A-3)		Lights
2.2	ELMER	24x25	Office Bldg 211 Rm K	Compound	
	ELMER	16x25	Lab Bldg 211 Rm E	Compound	Work benches, lights, power outlets.
	ELMER NAN	8x26 16x32	Trailer Space Work Tent #10 (B-2)	Compound Compound	110v AC Work bench, lights, outlets.
2.4	ELMER	16x32	Office-Work tent (B-2)	Decontamination Area	
2.51	ELMER	2/3 of tent 16x32	Office-Storage Tent (B-2)	Compound	110v, 60 cycle, AC; 220v, 4 wire, 3 phase.
	ELMER	12x30	Trailer Space	Compound	Water, 220v, 4 wire, 3 phase, 100 amps per phase.
	ELMER	12x50	Trailer Space	Compound	Water, 220v, 4 wire, 3 phase, 150 amps per phase.
2.52	OBOE	Unknown	Station 102		
2.61	NAN	16x32	Office, Tent #1 (B-2)	Compound	110v AC, lights, outlets.
	HOW	16x32	Work Tent	Rocket Launcher Site	Work benches, lights, outlets, 110v AC

TABLE VI-A-1

OFFICE, LABORATORY, AND WORK SPACE (Cont'd)

PROJ	LOCATION	SPACE ASSIGNED			REMARKS
		SIZE/FT	TYPE	AREA	
2.62	ELMER	14x14	Office-Work Tent (A-1)	Compound	Work bench, power outlets, vise
	ELMER	20x50	Concrete Slab	ELMER Beach	Fenced, Adjacent to Proj. 2.63 beach area.
	ELMER	20x20	Storage Area	ELMER Beach	Fenced, Adjacent to concrete slab.
	NAN	8x24	Trailer Space	Compound	
2.63	ELMER	16x24	Office-Lab, Bldg 223, Rm 10	Compound	Dehumidified. Lead shielding for instrumentation required.
	ELMER	16x24	Lab. Bldg 223 Rm 9	Compound	Air conditioned
	ELMER	16x24	Lab Bldg 223 Rm 8	Compound	Air conditioned
	ELMER	1/3 of tent 16x32	Office tent (B-2)	Compound	
	ELMER	16x32	Work tent (B-1)	Compound	Work bench, power, racks down center.
	ELMER	16x32	Work tent (B-1)	Compound	Work bench, power
	ELMER	8x28	Trailer Space	Compound	110v, 60 cycle, AC
	ELMER	8x28	Trailer Space	Compound	110v, 60 cycle, AC
	ELMER	3000 sq ft	Open Storage Area	Outside but Adjacent to Compound	Fenced, lighted, 110v, 60 cycle AC
	ELMER	1000 sq ft	Open Storage Area	ELMER Beach Area	110v, 60 cycle, AC
	ELMER	16x32	Work Tent (B-2)	ELMER Beach	110v, 60 cycle, AC. Work bench.
	NAN	16x32	Office-Work Tent (B-1)	Compound	Work bench, 110v AC
	NAN	16x32	Work tent (B-1)	Compound	Work bench, 110v AC
	NAN	16x32	Work-Storage Tent (B-1)	Compound	Work bench, 110v AC, racks down center
	NAN	10,000 sq ft	Beach area	NAN Beach Lagoon side	(Continued on next page)

TABLE VI-A-1

OFFICE, LABORATORY, AND WORK SPACE (Cont'd)

PROJ	LOCATION	SPACE ASSIGNED			REMARKS
		SIZE/FT	TYPE	AREA	
2.63 (Cont'd)	NAN	16x32	Work tent (B-2)	NAN Lagoon Beach	110v, 60 cycle, AC
	NAN	16x32	Work tent (B-2)	NAN Lagoon Beach	110v, 60 cycle, AC
	NAN	20x50	Concrete Slab*	NAN Lagoon Beach	To be shared with Project 2.62.
	FRED	16x32	Office, Bldg 117A	Outside Compound	Lights
	DAVID	Unknown	Bunker	Existing structure	
2.64	ELMER	14x14	Office Tent (A-4)	South side of Bldg 213	Work benches, 115v, 60 cycle, lights, and outlets.
	ELMER	20x30	Lab, Bldg 218	Existing structure	
	ELMER	22x 8	Trailer space	South side of Bldg 218	220v with center tap - 60 cycle, 10 kw power, cold water 20 gal/day
2.65	ELMER	16x24	Lab, Bldg 223 Rm 4	Compound	110v, 60 cycle, lights and power outlets, air conditioned.
	ELMER	15x30	Trailer Space	Compound	220v AC, 3 phase, 4 wire. Water and sewer utilities.
	ELMER	16x32	Office-Work Tent (B-4)	Compound	Work benches, power outlets, lights.
	ELMER	20x40	Sheltered Storage Bldg 418A	Outside Compound	110v AC
	NAN	14x14	Office-Work Tent #12 (A-2)	Compound	110v AC, Lights and power outlets.
	NAN	16x32	Work-Storage Tent #5 (B-4)	Compound	110v AC, lights and power outlets work benches.
	NAN	16x32	Work-Storage Tent #6 (B-4)	Compound	110v AC, lights and power outlets work benches
	NAN	30x100	Outdoor Storage	Near Compound	

(Continued on next page)

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TABLE VI-A-1

OFFICE, LABORATORY, AND WORK SPACE (Cont'd)

PROJ	LOCATION	SPACE ASSIGNED			REMARKS
		SIZE/FT	TYPE	AREA	
2.65 (Cont'd)	BIKINI Lagoon	14x14	Tent on Copter Barge	YC Sample Packaging Barge	Tent located on upwind corner of barge.
2.66	FRED	500 sq ft	Office, Bldg 633		
	FRED	700 sq ft	Lab, Bldg 640		Air conditioned, temp 70 ±4° F, Humidity 55 ±10%. 30 ft of work bench, 115v, 5 kw, 60 cycle single phase
	FRED	30x 8	Trailer Space	Adjacent Bldg 640	220/110v, single phase, 100 amps. Drain and water connections.
	FRED	30x 8	Trailer Space	Adjacent Bldg 640	220/110v, three phase, 60 amps. Drain and water connections.
2.7	ELMER	16x24	Office, work and* storage. Bldg 223, Rm 5	Compound	Shared with Projects 2.9 and 2.10
	ELMER	16x24	Instrument Repair* Space, Bldg 223, Rm 7	Compound	Shared with Project 2.8. Work bench, 110v AC, air conditioned 55 ±5% RH, 70° ±4°F
2.8	ELMER	16x24	Instrument Repair* Space, Bldg 223, Rm 7	Compound	Shared with Project 2.7. Work bench, 110v AC, air conditioned 55 ±5% RH, 70° ±4°F.
	ELMER	16x24	Counting Room Bldg 223, Rm 7	Compound	110v AC, air conditioned, 55 ±5% RH, 70° ±4°F.
	ELMER	14x14	Office Tent (A-2)	Compound	
	ELMER	16x32	Sample Processing Tent (B-1)	Decontamination Area	Work benches, 110v AC. Should be so constructed to permit confinement of contaminated dust.

TABLE VI-A-1

OFFICE, LABORATORY, AND WORK SPACE (Cont'd)

PROJ	LOCATION	SPACE ASSIGNED			REMARKS
		SIZE/FT	TYPE	AREA	
2.9	ELMER	16x24	Office-Work-Storage* Bldg 223, Rm 5	Compound	Shared with Projects 2.7 and 2.10
2.10	ELMER	16x32	Operations Office Tent (B-2)	Personnel Pier Area	110v, lights and power outlets.
	ELMER	16x32	Ships Office Tent (B-2)	Personnel Pier Area	110v, lights and power outlets.
	ELMER	16x32	Ships Office Tent (B-2)	Personnel Pier Area	Work bench, 110v, lights and power outlets.
	ELMER	4000 sqft	Storage Space	Personnel Pier Area	Open storage space.
	NAN	14x14	RadSafe Tent (A-2)	Outside Compound	
			* Spaces shared by two or more projects.		

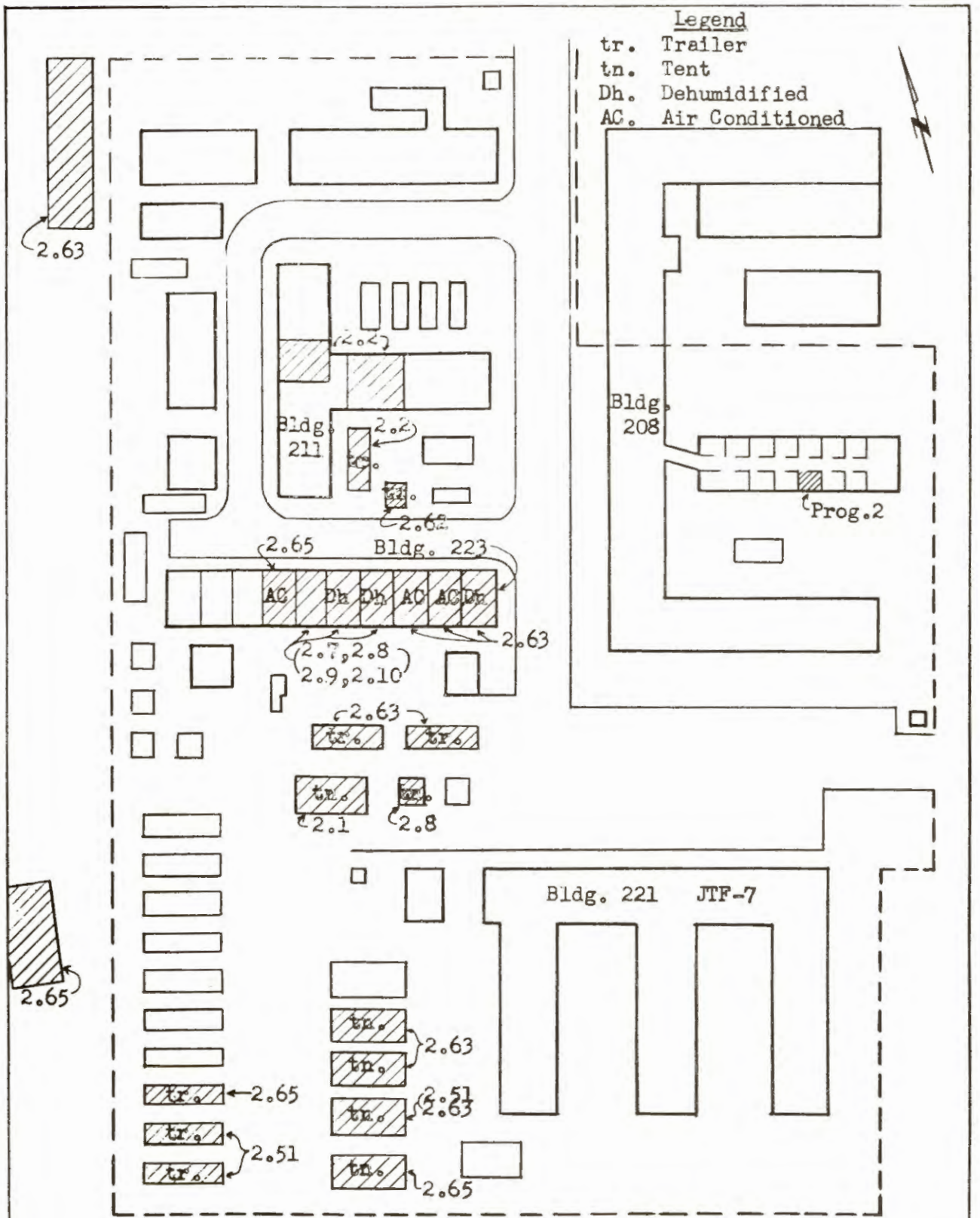

Fig. VI-A-1 ELMER Administration Compound

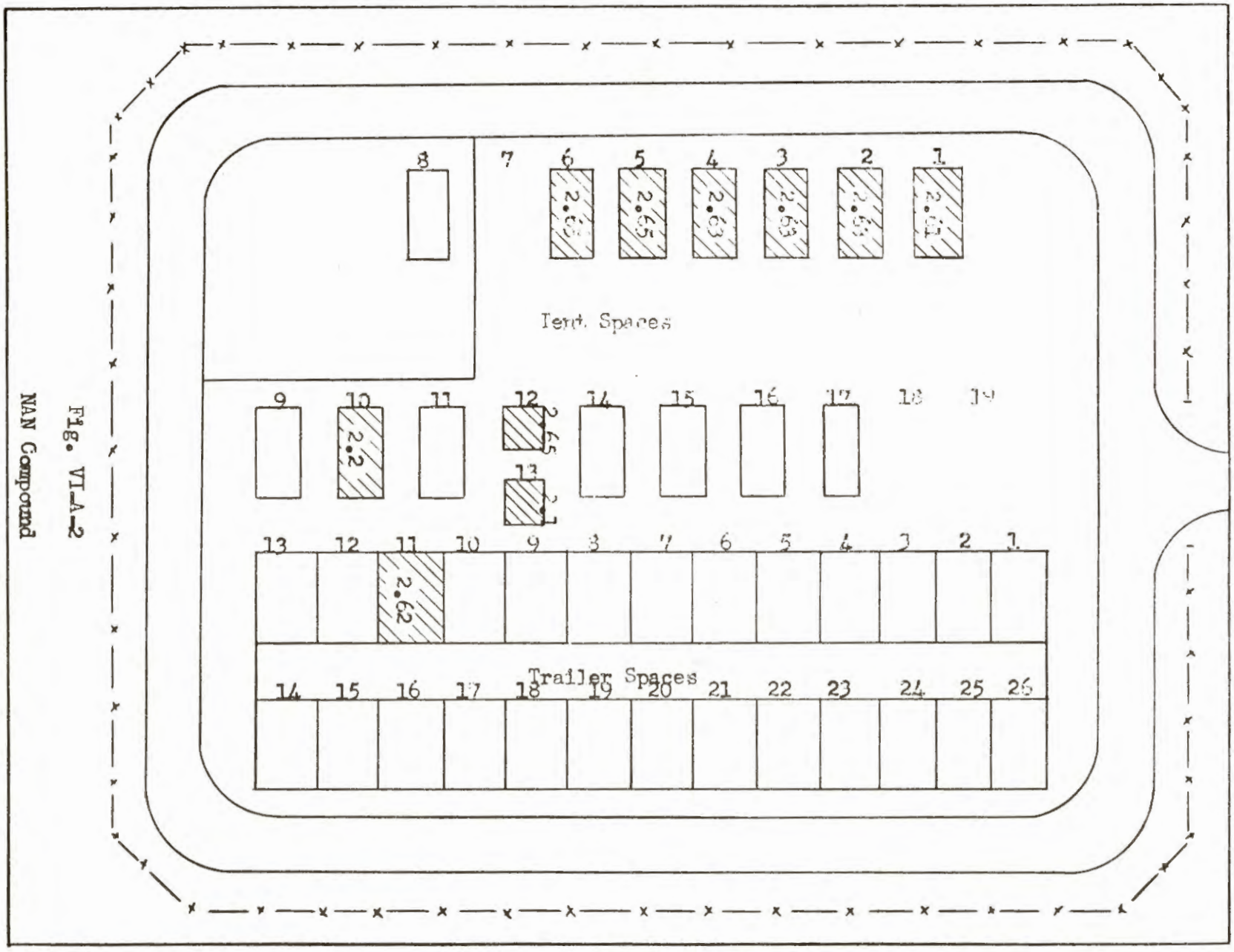

Fig. VI-A-2
NAN Compound

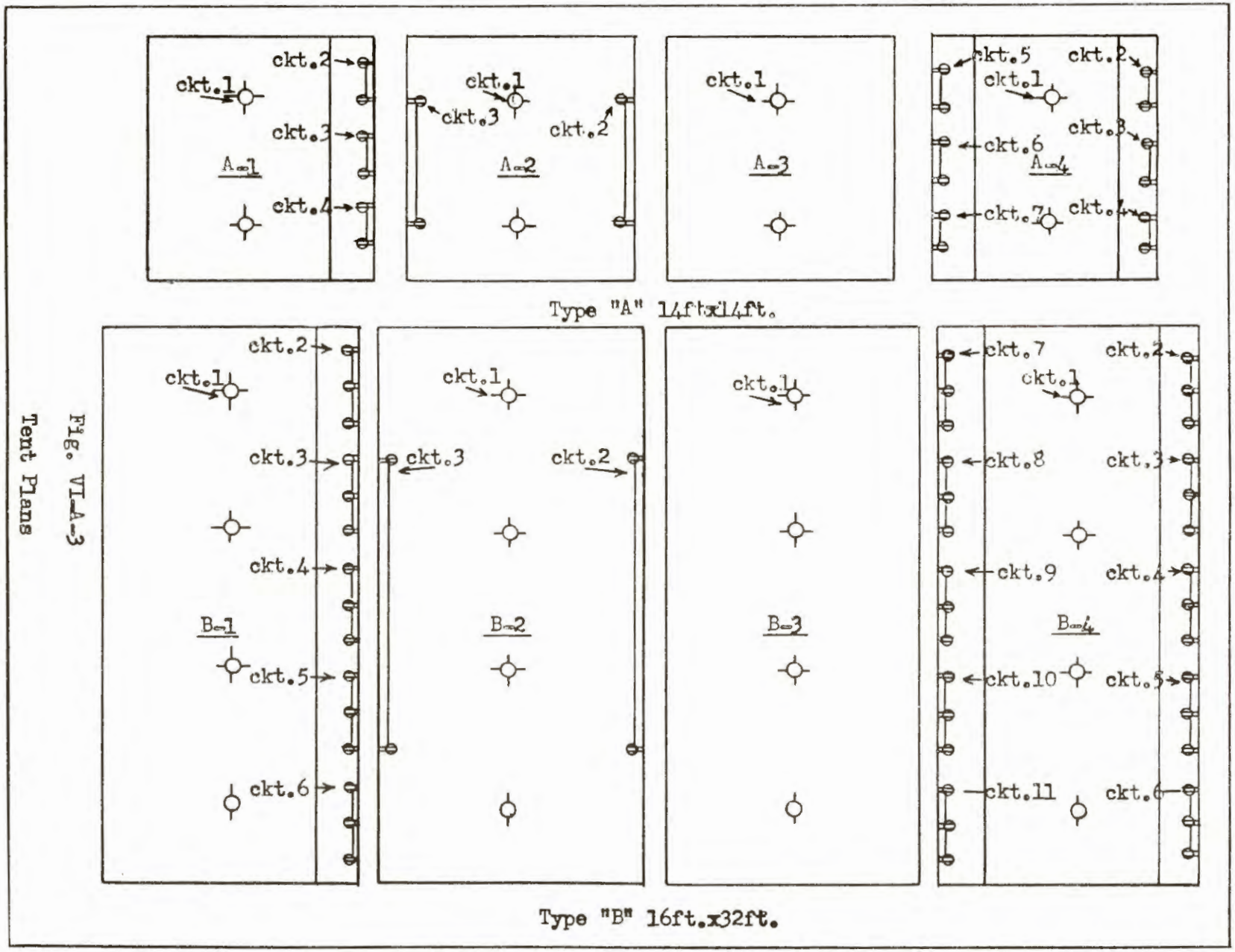

Fig. VI-A-3
Tent Plans

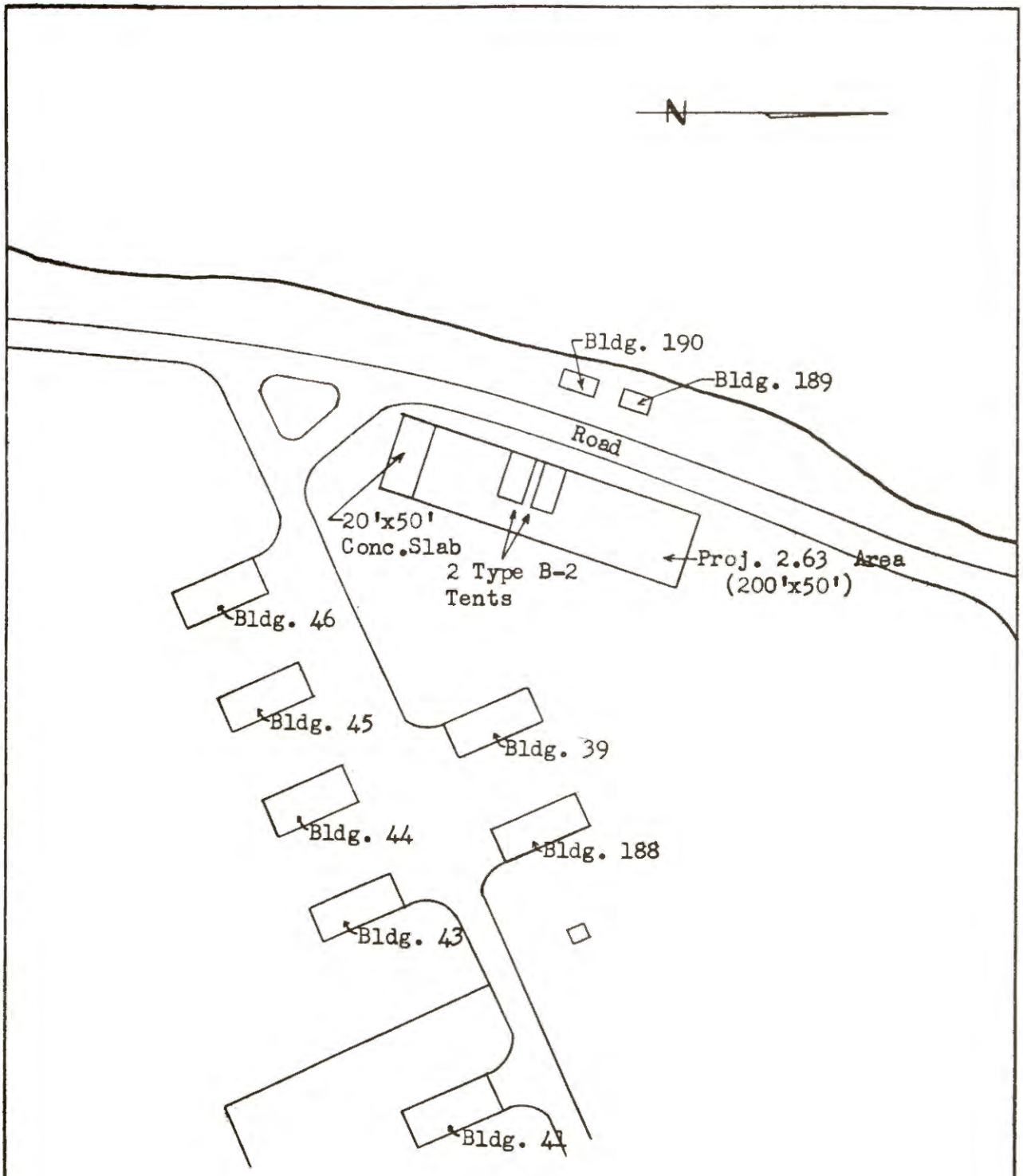

Fig. VI-A-4

Proj. 2.63 Work Area at NAN

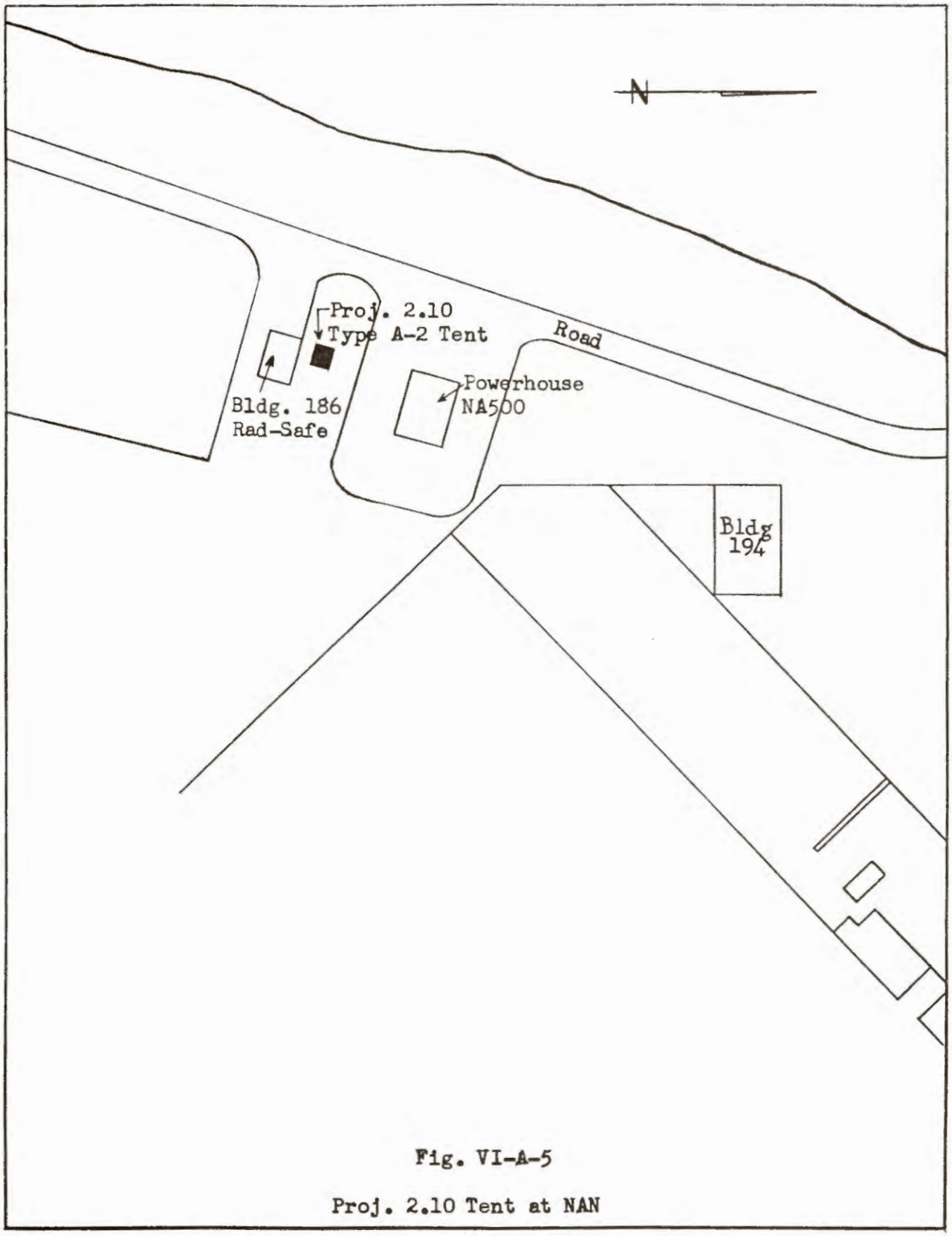

Fig. VI-A-5

Proj. 2.10 Tent at NAN

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 11"	Typewriter, 14"	Typewriter, 18"	Tables	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamps, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.1	ELMER	16x32	Off-Lab-Stor.tent (B-2)	Compound	2	1	2	1	1			2		1				3								3	1
	ELMER	31x9	Trailer space	Calibrate range	none																						
	ELMER	Calibration range			none																						
	NAN	14x14	Tent#13	Compound	none																						
	TARE	14x14	Tent A3	-	none																						
	FOX	14x14	Tent A3	-	none																						
2.2	ELMER	24x25	Bldg211 Rm K	Compound	2	2	4		1		1			1						1				1			1
	ELMER	16x25	Bldg211 Rm E	Compound														4								8	ext
	ELMER	8x26	Trailer space	Compound	none																						
	NAN	16x32	WorkTent #10	Compound														4								2	
2.4	ELMER	16x32	Off-Work Tent	Decontam Area	1		1		1			4	1													3	1
2.51	ELMER	2/3Tent 16x32	Off-Stor	Compound	1	1	1	1	2			1		1			2			1		1				6	1
	ELMER	12x30	Trailer Space	Compound									1											1			1
	ELMER	12x50	Trailer Space	Compound																				1			ext

(Continued)

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS (Cont'd)

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 11"	Typewriter, 14"	Typewriter, 18"	Tables	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamps, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.52	OBOE	unknown	Sta 102	-	1		3																				1
2.61	NAN	16x32	Office Tent #1	Compound	2		2			1			1				2									2	1
	HOW	16x32	WorkTent	Rocket launcher	1		1											2	1							3	1
2.62	ELMER	14x14	Office-work tent	Compound	1		1							1	1	1	1						2				1
	ELMER	20x50	Concrete slab	Beach	none																						
	ELMER	20x20	Storage area	Beach	none																						
	NAN	8x24	Trailer space	Compound	none																						
2.63	ELMER	16x24	Off-Lab Bldg223 Rm 10	Compound	1		1																			15	1
	ELMER	16x24	Lab, Bldg 223, Rm 9	Compound	1		1																				ext
	ELMER	16x24	Lab, Bldg 223, Rm 8	Compound	1		1																				ext
	ELMER	1/3Tent 16x32	Office Tent	Compound	3		3				3			1		1	6										1
	ELMER	16x32	Work tent	Compound	none																						
	ELMER	16x32	Work tent	Compound	none																						
	ELMER	8x28	Trailer Space	Compound																							1

(Continued)

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS (Cont'd)

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 18"	Typewriter, 14"	Typewriter, [illegible]	Table	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamp, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.63 cont'd	ELMER	8x28	Trailer space	Compound																							1
	ELMER	3,000 sq ft	Open storage	Outside compound	none																						
	ELMER	1,000 sq ft	Open storage	Beach	none																						
	ELMER	16x32	Work tent	Beach	1		1																				1
	NAN	16x32	Office-Work tent	Compound	3		3				1		1			1	6									10	1
	NAN	16x32	Work tent	Compound																							ext
	NAN	16x32	Work-storage tent	Compound																							ext
	NAN	10,000 sq ft	Beach area	Lagoon Beach	(3 outside work benches)																						
	NAN	16x32	Work tent	Lagoon Beach	2		2																				1
	NAN	16x32	Work tent	Lagoon Beach																							ext
	NAN	20x50	Concrete slab	Lagoon Beach	none																						
	FRED	16x32	Office Bldg117A	Outside Compound	1		1																			3	1
	DAVID	unknown	Bunker	Existing structure	none																						
2.64	ELMER	14x14	Office tent	S.side of Bldg 218		1	2	1	1																		1

(Continued)

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS (Cont'd)

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 11"	Typewriter, 14"	Typewriter, 18"	Tables	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamps, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.64 cont'd	ELMER	20x30	Lab Bldg 218	Existing structure									1														ext
	ELMER	22x8	Trailer space	S. side of Bldg 218																							ext
2.65	ELMER	16x24	Lab, Bldg 223, Rm 4	Compound																							1
	ELMER	15x30	Trailer space	Compound																							ext
	ELMER	16x32	Office-work tent	Compound	1	1	1	1		1		2	1		1	1		6							12	1
	ELMER	20x40	Sheltered storage	Outside Compound	none																						
	NAN	14x14	Office-work tent	Compound		1		1		1		1	1													5	1
	NAN	16x32	Work-storage tent #5	Compound																						4	
	NAN	16x32	Work-storage tent #6	Compound	none																						
	NAN	30x100	Outdoor storage	Near Compound	none																						
	Bikini Lagoon	14x14	Copter barge tent	YC sample packaging barge	none																						

(Continued)

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS (Cont'd)

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 11"	Typewriter, 14"	Typewriter, 18"	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamps, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.66	FRED	500 sq ft	Office Bldg 633	-	7	1	7	1		1			1			3										2
	FRED	700 sq ft	Lab Bldg 640	-																					7	1
	FRED	30x8	Trailer space	Adjacent Bldg 640																						ext.
	FRED	30x8	Trailer space	do																						ext.
2.7	ELMER	16x24	Off-work-stor, Bldg 223, Rm 5	Compound with 2.9 & 2.10	3		3		1			2	1			1			1						5	1
	ELMER	16x24	Inst-re-pair, Bldg 223, Rm 7	Compound with 2.8	1		1										3									1
2.8	ELMER	16x24	do	Compound with 2.7	Equipment shown under 2.7 listing.																					
	ELMER	16x24	Count rm Bldg223 Rm 6	Compound	none																					
	ELMER	14x14	Off-tent	Compound	5		5		1			1						1							4	1
	ELMER	16x32	Sample process tent	Decontam area	1		1										4									1
2.9	ELMER	16x24	Off-work-storage Bldg233, Rm5	Compound with 2.7 & 2.10	Equipment shown under 2.7 listing.																					

TABLE VI-A-2

OFFICE EQUIPMENT REQUIREMENTS (Cont'd)

Proj	Location	Size	Type	Area	Desk, executive	Desk, typist	Chair, executive	Chair, typist	Typewriter, 11"	Typewriter, 14"	Typewriter, 18"	Table	Safe, 2 drawer	Safe, 4 drawer	Stool, drafting	Table, drafting	Lamps, desk	Stool, lab	Cabinet, filing	Blackboard	Refrigerator	Cooler, water	Cabinet, storage	Clock, electric	Cabinet, visible file	Chair, straight back	Telephone
2.10	ELMER	16x32	Operation OfficeTent	Personnel Pier Area	5		5		1			2*		1			5		1	1						14	2+ 1ext
	ELMER	16x32	Ship's Office B1	Personnel Pier Area	15		15		3			1		4			15	3	3							2	2+ 2ext
	ELMER	16x32	Ship's Office B2	Personnel Pier Area	(Equipment included in listing immediately above)																						
	ELMER	4,000 sq ft	Storage space	Personnel Pier Area	none																						
	NAN	14x14	Rad Safe tent	Outside Compound	2		2					1							1							3	1
				TOTAL	64	8	70	6	12	4	5	17	7	12	2	4	41	29	7	4	0	1	2	3	0	108	33+ 15 ext

NOTE: *One radio table and
One conference table 3'x12'.

Chairs, straight back, include canvas chairs.

SECTION VI - B

VEHICLE REQUIREMENTS

Type Vehicle	Proposed Use	Island Location	Date Required		Remarks
			From	To	
PROJECT 2.1					
1 ea, 3/4 ton W/C	Transportation of personnel and equipment	PIPER	4-1	8-1	Full time use.
1 ea, 3/4 ton W/C	Transportation of personnel and equipment. Installation and recovery of instrument stations on a part time basis required prior to and after each event on Bikini.	NAN	4-1	8-1	Full time use 4-2 to 4-29
PROJECT 2.2					
1 ea, 3/4 ton W/C	Transportation of equipment and personnel.	PIPER	3-31	8-15	Full time use.
1 ea, 1/4 ton jeep	Transportation of equipment and personnel.	PIPER	3-15	8-15	Full time use.
1 ea, 3/4 ton W/C	Transportation of equipment.	NAN	3-25	8-15	Full time use.
1 ea, 1/4 ton jeep	Transportation of equipment and personnel.	NAN	3-25	8-15	Full time use.

SECTION VI - B

VEHICLE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required From	Date Required To	Remarks
PROJECT 2.4					
3/4 - 4X4 W/C or 1½ ton 6X6	Transportation of personnel and equipment.	ELMER	3-20	7-9	Full time use.
PROJECT 2.51					
2 ea, 3/4 ton W/C	Transportation of personnel and equipment.	ELMER	3-18	7-12	Gas, oil, other services required. Proj 2.51 will furnish driver.
1 ea, Tractor, D-7	Recovery operations - drag cable to safe area.	SALLY	6-1 6-18	6-2 6-19	
PROJECT 2.52					
1 ea, 3/4 ton truck w/"A" frame	Transportation of equipment and personnel.	OBOE & CHARLIE	3-31	5-5	If 3/4 ton truck not available, 2½ ton truck is satisfactory

SECTION VI - B

VEHICLE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required From	Date Required To	Remarks
PROJECT 2.61					
5 ton wrecker w/ powered boom	Handling rockets and launchers.	HOW	4-5	4-30	Place and orient launchers (3,000 lbs) and load rockets (300 lbs). Needed for test rocket launchings fired at 180° to usual flight before CHEROKEE.
2½ ton 6X6 truck	Transporting rockets	HOW	3-15	6-28	Request permanent assignment.
3/4 ton W/C	Transporting personnel and equipment.	HOW	3-15	6-28	Request permanent assignment.
PROJECT 2.62					
2½ ton truck	Transportation of skiffs, anchors, cable, etc., from dock to staging area.	ELMER	3-24	7-1	Intermittent use.
PROJECT 2.63					
2 ea, 1/4 ton truck (jeep)	Transport equipment and personnel.	ELMER	3-19	7-1	Desire permanent assignment to Proj 2.63

(Continued on next page)

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SECTION VI - B

VEHICLE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required From	Date Required To	Remarks
PROJECT 2.63 (Cont'd)					
1 ea 3/4 ton W/C	Transport equipment and personnel.	EIMER	3-19	7-1	Desire permanent assignment to Proj 2.63
1 ea, 2½ ton truck	Transport equipment and personnel.	EIMER	3-19	7-1	Intermittent use.
1 ea,5 ton wrecker w/boom	Equipment handling.	EIMER	3-19	7-1	Intermittent use.
2 ea, 1/4 ton truck (jeep)	Transport equipment and personnel.	NAN	3-19	7-1	Desire permanent assignment to Proj 2.63
1 ea, 3/4 ton W/C	Transport equipment and personnel.	NAN	3-19	7-1	Desire permanent assignment to Proj 2.63
1 ea, 2½ ton truck	Transport equipment and personnel.	NAN	3-19	7-1	Intermittent use.
1 ea, 5 ton wrecker w/boom	Equipment handling.	NAN	3-19	7-1	Intermittent use.
					Proj 2.63 anticipates H&N personnel having necessary fork lifts, cranes, & flat bed trucks to handle equip- as needed.

SECTION VI - B

VEHICLE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required From	Date Required To	Remarks
PROJECT 2.64					
3/4 ton W/C	Transport equipment and samples to and from project support aircraft (FRED) and laboratories (EIMER)	EIMER	4-1	8-4	
1 ea 1/4 ton jeep	Transport personnel and material to other project and TU-3 Officer	EIMER	4-15	8-4	
PROJECT 2.65					
2 ea,3/4 ton trucks	Transport supplies and samples.	EIMER	4-1	8-8	
4 ea,3/4 ton trucks; 2/w "A" frame 2/w winch	Transport supplies and samples.	NAN	3-21	7-18	Bed and cabs of all trucks should be covered with truck tarps.
PROJECT 2.66					
1 ea,½ ton truck	Transport electronic equipment and personnel between aircraft and shops, move survey teams and equipment between decontamination area and photo lab.	FRED	3-30	7-5	
1 ea,½ ton truck			4-10	7-5	

(Continued on next page)

SECTION VI - B

VECHILE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required		Remarks
			From	To	
PROJECT 2.66 (Cont'd)					
1 ea,1/4 ton truck (jeep) w/ trailer hitch	Movement of power unit between aircraft and to and from flight line.	FRED	4-10	7-9	
PROJECT 2.7					
1 ea, 3/4 ton 4X4 W/C with top	Transport of personnel and equipment.	EIDER	4-1	8-1	Request full time assignment to Proj 2.7
PROJECT 2.8					
2 ea, 1/4 ton truck (jeep)	Transport personnel and equipment.	EIDER	4-15	7-1	Request full time assignment to Proj 2.8
1 ea 3/4 ton W/C	Transport equipment.	EIDER	4-1	7-1	Request full time assignment to Proj 2.8

SECTION VI - B

VEHICLE REQUIREMENTS (Cont'd)

Type Vehicle	Proposed Use	Island Location	Date Required From	Date Required To	Remarks
PROJECT 2.9					
3/4 ton 4X4 truck cover for cab & rear section	Transport personnel and equipment	ELMER	4-1	7-2	Request full time assignment to Project 2.9.
PROJECT 2.10					
3 ea,1/4 ton truck (jeep - 4X4)	Transport personnel and equipment (one per ship).	ELMER	3-15	7-1	Request full time assignment to Project 2.10.
1 ea, 1/4 ton truck (jeep - 4X4)	Transport personnel and equipment.	NAN	4-1	7-1	Request full time assignment to Project 2.10.

SECTION VI - C

PROJECT 2.1 HELICOPTER REQUIREMENTS

EVENT	STATION LOCATION	TIME BEGIN	TIME DURATION	NO. OF PROJ. PERSONNEL	WT.& CU OF PROJ EQUIPMENT	REMARKS (Including no. of helicopters)
CHEROKEE	ABLE CHARLIE	After H+24 before H+36	1 hr	3	100 lbs 4 cu ft	Copter - or DUKW on LCU. (this requirement also listed under ship and boat requirements). Earliest possible time in order to minimize effects of residual gamma contributions to total initial gamma expo - sure.
ZUNI	OBOE PETER ROGER UNCLE	After H+24 before H+36	1 hr	3	100 lbs 6 cu ft	do
FLATHEAD HURON NAVAJO APACHE	DOG EASY FOX GEORGE	After H+24 before IH+36	1 hr	3	100 lbs 6 cu ft	do Station locations apply for each event listed.

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SECTION VI - C

PROJECT 2.2 HELICOPTER REQUIREMENTS

EVENT	STATION LOCATION	TIME		NO. OF PROJ. PERSONNEL	WT. & CU OF PROJ EQUIPMENT	REMARKS (Including no. of helicopters)
		BEGIN	DURATION			
CHEROKEE HURON FLATHEAD NAVAJO APACHE	ABLE CHARLIE DOG EASY FOX GEORGE YOKE NAN OBOE PETER LOVE HOW ALFA WILLIAM ROGER	H+36 or as soon after as RadSafe permits	5 min minimum per station. Total recovery time estimated 4 hrs	2 teams of 3 people each	400 lbs 50 cu ft each item	Copter or LCM (or LCU), and DUKW for each team. (Also listed under Ship and Boat requirements)
ZUNI	DOG EASY FOX GEORGE HOW OBOE PETER ROGER LOVE NAN WILLIAM ALFA YOKE	do	do	do	do	do

SECTION VI - C

PROJECT 2.51 HELICOPTER REQUIREMENTS

EVENT	STATION LOCATION	TIME BEGIN	TIME DURATION	NO. OF PROJ. PERSONNEL	WT. & CU OF PROJ EQUIPMENT	REMARKS (Including no. of helicopters)
CHEROKEE	3 land stations on CHARLIE	D-10	Est. 2 hrs	5 (plus Proj 2.52 personnel)	100 lbs 10 cu ft	1 copter. Recovery dry run. Train each team in turn.
CHEROKEE	do	As soon after H-hr as RadSafe permits. Est. H+9	1 hr	2 in each copter(plus Proj 2.52 personnel)	100 lbs 10 cu ft per copter	3 copters are planned (1 for each station). Recovery is combined with Proj 2.52. 1 copter may be used if conditions permit.
YUMA	URSULA	H-24 D-2		5	300 lbs 30 cu ft	Transport personnel to pick up DUKW at URSULA
do	do	H-18		5		Pick up personnel at URSULA and transport to ELMER.
do	do	As soon as possible Est. H+3	4 hrs	5	300 lbs 30 cu ft	1 copter transport personnel to pick up DUKW at URSULA for sample recovery, and return personnel to ELMER.
KICKAPOO	SALLY	Est. H+10	2 hrs	2	300 lbs 30 cu ft	1 copter return collected samples to PARRY
BLACKFOOT	YVONNE	Est. H+10	2 hrs	2	100 lbs 27 cu ft	1 copter return collected samples to PARRY
CHEROKEE	CHARLIE	Est. H+10	½ hr	3	100 lbs 27 cu ft	After recovery on CHEROKEE one copter is required to transport recovered samples to NAN. From NAN a fixed wing aircraft will be required to transport the samples to PARRY.

SECTION VI - C

HELICOPTER REQUIREMENTS PROJECT 2.52

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. of Helicopters)
		Begin	Duration			
CHEROKEE	3 land stations on CHARLIE	D-12	1 day	3		Copter or LCM to install samplers at stations
do		D-10	Est 2 hrs	2 (Plus Proj. 2.52 pers.)	50 lbs 1 cu ft each copter	Dry run of recovery. Copter is planned due to the need to time and train for early recovery. This practice recovery is combined with Proj 2.51 since same 3 stations are involved.
do	Station 102 on OBOE	Depart from carrier at H+6	½ hr	3	10 lbs 1 cu ft	One copter required for taking two men to OBOE station for instrument warmup and calibration.
do	3 land stations on CHARLIE	As soon after H-hr as Rad. Safe permits Est. H+9	1 hr	2 in each copter (Plus 2.51 personnel)	50 lbs 1 cu ft each copter	Three copters are planned (one for each station) due to the need for early recovery. This combined with Proj 2.51 since same 3 stations are involved.
						Continued on next page

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SECTION VI - C

HELICOPTER REQUIREMENTS PROJECT 2.52 (Cont'd)

Event	Station Location	Begin	Duration	No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including No. of Helicopters)
CHEROKEE	CHARLIE	Immed. after sample recovery Est. H+10	½ hr	2 in each copter (Plus 2.51 personnel)	50 lbs 1 cu ft each copter	After recovery the 3 copters will proceed to station 102 on CROE with samples and discharge 2 of the recovery crew. The remainder of the Proj recovery crew may be discharged at the carrier or NAN.

SECTION VI - C

HELICOPTER REQUIREMENTS PROJECT 2.61

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	(Including No. of Helicopters)
		Begin	Duration			
CHEROKEE ZUNI HURON NAVAJO TEWA FLATHEAD	HOW	H-24	6 hrs	5	100 lbs 5 cu ft	Helicopter or M-boat. (This requirement is also being listed under Ship and Boat Requirements) Purpose is to make final azimuth and elevation adjustments to launchers on basis of latest weather information.

SECTION VI-C

HELICOPTER REQUIREMENTS PROJECT 2.63

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including No. of Helicopters)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	NAN 2.63 barge stations and HOW	H-22	4 hrs	5	200 lbs 50 cu ft Each copter	Two helicopters to transport 2 arming teams to YFNB and HOW Island stations.
do	do	As soon as possible Est H+6	6 hrs	5*	do	One copter. Personnel listed comprise an early recovery team for the YFNB barges and HOW. This entry will include RadSafe support from Proj 2.10 and operating crews necessary for recovery. Teams will first proceed to NAN, then to lagoon barges, HOW, and return to NAN with samples. A total of 2 or 3 trips will be involved. After recovery of samples personnel will remain on NAN unless existing radiological conditions necessitate removal to hotel ship. NOTE: *Includes RadSafe and Proj 2.10 personnel.
						(continued on next page)

SECTION VI - C

HELICOPTER REQUIREMENTS PROJECT 2.63 (Cont'd)

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including No. of helicopters)
		Enter	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAGs 39-40 and LST611	YAG 40 H+30 YAG 39 H+13 YAG 39 H+80 LST 611 H+55	At ELMER At NAN At ELMER At ELMER	5	250 lbs 60 cu ft	Personnel listed comprise pick-up team for early sample return from ships. Samples recovered to be flown to ELMER for analysis on earliest possible flight. If the position of the ships after fall-out is such that return to Eniwetok Atoll is more economical of time, this copter pickup requirement should be transferred to ELMER Island.
Helicopter transportation to the YAGs and the LST will also be required while these ships are standing by at the firing site prior to an event.						

SECTION VI - C

HELICOPTER REQUIREMENTS PROJECT 2.64

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including No. of Helicopters)
		Begin	Duration			
SEMINOLE MOHAWK	Fall-out area over water	D-day Est H+6	4 hrs	2	250 lbs 4 cu ft	Copter with project furnished portable gamma spectrum analyzer to evaluate the air absorption factor as a function of altitude. Equipment is completely portable and no special modification installation necessary for copter. Survey should take about 4 hrs.
NAVAJO	Fall-out area over water	D+1 Est H+26	4 hrs	2	250 lbs 4 cu ft	Copter to be available for strapping test equipment approximately 2 hrs prior to flight. Need 28 volts, 10 amp, and 28 volts, 15 amp convenience outlets in copter.

SECTION VI - C

PROJECT 2.65 HELICOPTER REQUIREMENTS

EVENT	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including No. of helicopters)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Survey of islands in Bikini Atoll	ASAP Est H+8 Again at H+31 and D+3	Est 6 hrs	3	200 lbs 10 cu ft	Fallout sample collection on HOW and LOVE in conjunction with Proj 2.63, plus 2 for aerial survey of all islands by probe attached to long cable. Instrument is read in helicopter.
LACROSSE	Survey of islands in Eniwetok Atoll	ASAP Est H+8 Again at H+31 and D+3	Est 3 hrs	3	200 lbs 10 cu ft	Fall-out sample collection on selected islands plus aerial survey of all islands by probe attached to long cable. Instrument is read in helicopter.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	ABLE CHARLIE* DOG** FOX GEORGE HOW LOVE NAN OBOE UNCLE YOKE BRAVO VICTOR	H+26	5 hrs	3	500 lbs	Recovery of samples will begin at lesser contaminated islands and continue on "hotter" islands afterward. Two or 3 stations will be visited on each round trip. Estimated time at each station 10 min.
		(* except CHEROKEE) (** except NAVAJO and TEWA)				
		No helicopter requirements for Projects 2.66 thru 2.10.				

SECTION VI - D

SHIP AND BOAT REQUIREMENTS, PROJECT 2.1

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. & type ship or boat)
		Begin	Duration			
CHEROKEE	ABLE CHARLIE		1 hr work 6 hr travel			(For Notes and Code see Page 1 DUKW or LCU or 1 helicopter.
ZUNI	OBOE PETER ROGER UNCLE	After H+24 but before H+36	1 hr work 5 hr travel	3	100 lbs 6 cu ft	
FLATHEAD HURON NAVAJO APACHE	DOG EASY FOX GEORGE		1 hr work 4 hr travel			See Note 1.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS, PROJECT 2.2

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. & type ship or boat)
		Begin	Duration			
CHEROKEE FLATHEAD HURON NAVAJO APACHE	ABLE, CHARLIE, DOG, EASY, FOX, GEORGE, YOKE, NAN LOVE, HOW ALFA, PETER, OBOE, WILLIAM, ROGER	ASAP after H+36 Est H+48	5 min. per station Est. (-5) hrs total	2 teams- 3 men each team.	400 lbs 50 cu ft per team	1 DUKW and LCM (or LCU) for each team (or one Helicopter for each team) See Note 1.
ZUNI	DOG, EASY FOX, GEORGE, YOKE, HOW OBOE, PETER, ROGER, WILLIAM ALFA LOVE, NAN	ASAP after H+36 Est H+48	10 min. per station Est 5-6 hrs total	2 teams- 3 men each team	400 lbs 50 cu ft per team.	One DUKW and LCM (or LCU) for each team. (or one Helicopter for each team)

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.4

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. & type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO	YAC-39 YAG-40			2 est each trip - 1 est trip each day	25 lbs 1 cu ft est average per trip	LCM for transportation of equipment and personnel to and from the ships anchored off ELMER See Note 4.
CHEROKEE ZUNI FLATHEAD NAVAJO	YAG-39 YAG-40	D-3	4 hrs	3 H&N boat crew 3 H&N crane crew & riggers. 2 Proj Pers.	12,000 lbs 2300 cu ft	One LCU with long boom crane to handle panel assemblies for transfer from ELMER to YAG's.
CHEROKEE ZUNI FLATHEAD NAVAJO	YAG-40	D+1	2 hrs	3 H&N boat crew. 3 H&N crane crew & riggers. 1 Project Monitor	12,000 lbs 2300 cu ft	One LCU with long boom crane to handle panel assemblies for transfer to decontamination area on ELMER.
CHEROKEE ZUNI FLATHEAD NAVAJO	YAG-39	D+3	2 hrs	do	do	do

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.51

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE	CHARLIE	D-12		5 project +2 H&N		DUKW w/A-frame or monorail hoist and LCM to install steel plates.
CHEROKEE	3 sta. on CHARLIE 1 sta. on reef	H-43	24 hrs	5	100 lbs 10 cu ft	DUKW & LCM for mounting samples on stations. Must return to NAN by H-18
CHEROKEE	CHARLIE reef station	ASAP est. H+9	1 hr 6 hr return	2	25 lbs 2.5 cu ft	DUKW & LCU for recovery of samples. LCU will carry samples to NAN.
KICKAPOO	SALLY	D-2	24 hrs	5	300 lbs 30 cu ft	DUKW & LCM - sample installation.
YUMA	SALLY	H-24	6 hrs	5	300 lbs	Use a DUKW based at URSULA camp for mounting samples.
YUMA	SALLY	ASAP est.H+3	4 hrs	5	300 lbs 5 cu ft	Use DUKW based at URSULA camp to recover samples. LCM required to transport tractor to SALLY.
KICKAPOO	SALLY	ASAP est.H+8	4 hrs	5	300 lbs 5 cu ft	DUKW & 2 LCM's - sample recovery. Second LCM to transport tractor.

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SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.51 (Cont'd)

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj. Equipment	Remarks (including No.& tyre ship or boat)
		Begin	Duration			
BLACKFOOT	YVONNE	H-2	8 hrs	5	200 lbs	DUKW & LCM - Sample installation coordinated with Proj. 12.1
BLACKFOOT	YVONNE	D-1		5		DUKW w/A frame or monorail hoist & LCM to instrument concrete boxes.
BLACKFOOT	YVONNE	ASAP est. H+8	2 hrs	5	200 lbs 5 cu ft	DUKW & LCM - sample recovery coordinated with Proj. 12.1.
BLACKFOOT	YVONNE	H+12	2 hrs	5		DUKW w/A frame or monorail hoist & LCM to recover detectors from concrete boxes.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.52

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj. Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE	CHARLIE	D-25	1 day	3	3/4 Ton Truck	LCM to transport truck & personnel from OBOE to CHARLIE & back to OBOE.
CHEROKEE	CHARLIE	D-12	1 day	3	3/4 Ton Truck	LCM to transport truck & personnel from OBOE to CHARLIE for container installation and back to OBOE.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.61

Event	Station Location	Time		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD HURON NAVAJO TEWA	HOW	H-24	6 hrs	5	100 lbs 5 cu ft	LCM or Helicopter*. From NAN to HOW to make final aiming adjustments on rocket launchers.
do	AT SEA	H-6	7 hrs	5	Project telemeter receiving equipment.	APD 101 - USS HUDSON - stationed about 35 miles from GZ perpendicular as possible to rocket flight path. Proj. requires APD at PPG by 15 April.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.62

Event	Station Location	TIME Begin	TIME Duration	No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
Pre-CHEROKEE	BIKINI LAGOON	25 Mar	4 wks	5	Proj Equipment	LCU with equipment trailers aboard to perform oceanographic survey of BIKINI LAGOON. See Note 2.
Pre-CHEROKEE and Pre-ZUNI	Skiff Stations	Early April	Until First Event	3 possibly 4	Skiffs, instrument floats & anchors	USS SIOUX (ATF-75) used for installation of deep-moored skiffs
CHEROKEE ZUNI NAVAJO FLATHEAD APACHE TEWA	At sea	Early April	Duration of Operation	0	100 lb 5 cu ft	Service penetration rate recorders on skiffs.
CHEROKEE FLATHEAD NAVAJO APACHE		ASAP est. H+10	Until next event	3	Project Equipment - 1 trailer 3000 ft 4 ton 1 fork lift 3 ton 700 cu ft Inside trailer 4 ton	Resurvey. LCU with equipment trailers aboard to perform preliminary resurvey of BIKINI LAGOON.
ZUNI TEWA		ASAP est. H+26	Until next event			
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	FALL-OUT AREA	Est. H+3	4 days	3 on each DE	1000 lb 50 cu ft exclusive of modifications to DE's.	DE-534 - SILVERTON and DE-365 - MCGINTY have been assigned to Project 2.62 to perform survey of fall-out area. Project requests DE's at PPG by 21 April 56. (Continued on next page)

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SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.62 (Cont'd)

Event	Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. & type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	FALL-OUT AREA	Est. H+3	Until next event	19 crew 9 scientific	N/A	M/V HORIZON is an SIO vessel. Will arrive at PPG on 25 March 56. Will perform oceanographic & radiological work throughout tests.
CHEROKEE ZUNI FLATHEAD NAVAJO APACHE TEWA	LACOON	ASAP Est. H+10	Until next event	2	3000 lbs 100 cu ft	34 ft buoy boat provided by SIO as general utility boat for Projects 2.62 & 1.9. Arrive at PPG by 25 March 56.

SHIP AND BOAT REQUIREMENTS, PROJECT 2.63

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including no. & type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Out to 30 mi from GZ in fall-out area	10 Apr	Continuous use	Skiffs unmanned.	150 lbs 10 cu ft in each skiff	16 skiffs and 2 spares will be furnished by Proj 2.63 and will be deep sea moored prior to CHEROKEE. Data will be collected between shots and equipment reset.
do	Skiff stations	10 Apr	Continuous	Crew - 8 Proj 2.62 -4 Proj 2.63 -4	n/a	SIOUX assigned to this project for skiff mooring and servicing. Full time use of this vessel will be required.
do	Bikini Lagoon	10 Apr		Barges unmanned	Proj 2.63 equipment.	YFNB barges 13 and 29 are assigned as collection platforms for Proj 2.63. To be towed into position, repositioned between shots, and anchored by TG 7.3.
do	Bikini Lagoon	10 Apr	Continuous	Rafts unmanned	do	3 pontoon rafts to be towed into position and anchored by TG 7.3.
do	Bikini Lagoon	Occasional use		n/a	n/a	Towing service to accomplish repositioning of barges.
do	Bikini Lagoon	Occasional use		n/a	n/a	LSU with crane, rigging and operating crew for occasional use.
do	Anchored off NAN	After shot		Proj 2.63,-5 to 15 Proj 2.65 -2		YC barge to be used as packaging station for Proj 2.63 and 2.65 in case NAN is contaminated.

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SHIP AND BOAT REQUIREMENTS, PROJECT 2.63 (cont'd)

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (Including no. & type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YFNB's in Bikini Lagoon & HOJ Is.	H-22	4 hrs	10 ea	250 lbs 50 cu ft each	2 LCM's (see Note 3) for final instrumentation.
do	Raft #1	H+8	½ hr	5	150 lbs 50 cu ft	2 LCM's for recovery of samples not included in earlier copter trip. Samples to be delivered to NAN for flight to ELMER.
	Raft #2	H+9½	½ hr	5		
	Barge #2	H+10	¼ hr	5		
	Raft #3	H+11	½ hr	5		
	LOVE	H+11½	½ hr	5		
	Other Atoll islands	D 1		5		
do	Eniwetok Atoll					See Note 4.
	Eniwetok Atoll	1 Apr	2 wks			LCU support vessel for instrumentation work.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.65

Event	Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No. & type ship or boat)
		Begin	Duration			
	Rongerik Island	1st. 10 Apr	2-3 days	0	650 lbs	Initial delivery of equipment on LST which will carry weather station personnel & equipment to Rongerik Atoll.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAG-39 at NAN	On arrival of YAG-39	2 hrs	3	100 lbs 5 cu ft	LCM required for journey from NAN (or Proj. 2.63 YC packing barge) to YAG-39 & back with samples.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAG-40 at ELMER	On arrival of YAG-40	2 hrs	3	100 lbs 5 cu ft	LCM required for journey from ELMER to YAG-40 & back with samples.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	LST-611 at ELMER	On arrival of LST-611	2 hrs	3	100 lbs 5 cu ft	LCM required for journey from ELMER to LST-611 & back with samples.
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAG-39 at ELMER	On arrival of YAG-39	2 hrs	3	100 lbs 5 cu ft	LCM required for journey from ELMER to YAG-39 & back with samples.

(Continued on next page)

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.65 (Cont'd)

Event	Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Bikini Atoll	Intermittent during tests from 5 April to 1 July.				One DUKW with monorail hoist for installation & recovery of equipment plus 2 LCM's.
LACROSSE	Eniwetok Atoll	Intermittent during period 15 April to 7 May				One LCM for installation and recovery of equipment.
CHEROKEE ZUNI NAVAJO TEWA	Bikini Atoll	H+6	4 hrs	n/a	n/a	Radar tracking of Proj. 2.65 survey helicopters from USS CURTISS.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.7

Event	Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO	YAG-39 YAG-40	When ships are moored off ELMER.		8 est. each trip. 4 trips est. daily.	50 lbs 2 cu ft est. as average per trip.	See Note 4.
CHEROKEE ZUNI FLATHEAD NAVAJO	Bikini Lagoon	D-1 See Proj 2.10 for schedule.		3 maximum	Trivial	Transfer from YAG-39 to Hotel Ship. See Proj. 2.10
CHEROKEE ZUNI FLATHEAD NAVAJO	Bikini Lagoon	D-1 See Proj. 2.10 for schedule		3 maximum	Trivial	Transfer from YAG-40 to Hotel Ship - See Proj. 2.10
CHEROKEE ZUNI FLATHEAD NAVAJO	Bikini Lagoon	Earliest time feasible		6 maximum	Trivial	Transfer from Hotel Ship to ELMER by most convenient means.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.8

Event	Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAG-39 YAG-49 LST-611	When ships are moored of ELMER.		15 est. each trip. 2 est. trips daily.	200 lbs 10 cu ft est. as average per trip.	See Note 4.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.9

Event	Station Location	TIME		No. of Proj. Personnel	Wt & Cu of Proj Equipment	Remarks (including No.& type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	YAG-39 YAG-40 LST-611	When ships are moored off EIMER.		2 est. each trip. 2 trips est. daily.	5 lbs 1 cu ft est. as average per trip.	See Note 4.

SECTION VI - D

SHIP AND BOAT REQUIREMENTS PROJECT 2.10

Event	Location	Time		No. of Proj Personnel	Wt & Cu of Proj Equipment	Remarks (including No & type ship or boat)
		Begin	Duration			
CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Fall-out Zone - About 50 mi from GZ.	Leave Bikini	Est. 4 hrs	N/A	N/A	YAG-40 maneuvered into fall-out area. Manned during fall-out from shielded room. See Proj. 2.10 Operations for details.
do	Fall-out Zone - about 75 mi from GZ.	Leave Bikini est. H-12	Est. 5 hrs	N/A	N/A	YAG-39 maneuvered into fall-out area. Manned during fall-out from shielded room. See Proj. 2.10 Operations for details.
do	Fall-out Zone - about 175 mi from GZ	Leave Bikini Est. H-16	Est. 17 hrs	N/A	N/A	LST-611 maneuvered into fall-out area. Manned during fall-out from shielded room. See Proj. 2.10 Operations for details.
do	YAG-39 YAG-40 LST-611	When ships are moored off ELMER.				See Note 4.
do	Off ELMER Personnel Pier.	During operation.				Desire exclusive use of small aluminum row boat for use in mooring YAG small boats off pier. Proj. 2.10 will furnish this row boat.

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SECTION VI - D

SHIP AND BOAT REQUIREMENTS (REMARKS)

CODE:

*: The listed requirement is also listed under helicopter requirements.

ASAP: Entry as soon as Rad Safe conditions permit.

/: Includes Rad Safe personnel.

NOTES:

Note 1: 2 ea DUKW's will be used by this project in the overall installation and recovery of instrument stations on all shots participated in by the project. Project will furnish 2 DUKW's and ship them to PPG, where they will be assigned to the TG 7.1 Motor Pool. Two DUKW's will be needed essentailly full time by the project from 15 March to 1 July.

Note 2: The LCU must be furnished to Proj. 2.62 on a full time basis from 25 March throughout the tests. It will have aboard an oceanographic trailer, a Proj. 1.9 wave measurement trailer and a special work shop trailer. An LCM has been requested by Proj. 1.9 for entry to the anchored LCU and this is being handled by Program I.

Note 3: Permanent assignment of one of these LCM's have been requested for Proj. 2.63 for transportation to and from instrument stations in Bikini Lagoon.

Note 4: A total of two LCM's have been request full time for Projects 2.4, 2.63, 2.7, 2.8 and 2.9 for transportation between ELMER personnel pier and YAG's 39 and 40 and LST 611 when these are in the Lagoon. Service desired from 1 April until end of operation.

SECTION VI - E

RADIO REQUIREMENTS BY PROJECTS

Project	Instrument Location	Type of Service or Equipment	Frequency	Traffic Load	Remarks
2.1	2 DUKW's	DOD Net 4	53.6 MC	Light throughout operation.	See Notes 1 & 3.
2.2	2 DUKW's	DOD Net 4	53.6 MC	do	do
2.4	None				
2.51	None				
2.52	None				
2.61	HOW rocket launcher. NAN Bldg 70, USS KNUDSON.	BC-610 (E or H) transmitter. R-390/URR receiver	3000 KC	H to H+20 min on CHEROKEE, ZUNI, FLATHEAD, HURON, NAVAJO, TEWA	
2.62	SIO buoy boat, SIO asgd LCU, SIO LCM, DE 534, DE 365, SIOUX, M/V HORIZON, Prog 2 Control Center, work skiff off SIOUX.	DOD Net 4. VRC - 18 Rx and Tx Channel F	53.6 MC	25 Mar to final event CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE, TEWA. Prior to H-24 of CHEROKEE, intermittent heavy. H-24 to H+36 all events, none or slight. H-36 to H-24, intermittent heavy.	See Notes 2 & 3.
	M/V HORIZON, DE 534, DE 365, Prog 2 Control Center	Surface communications net. Channel D	2-18 MC	1 Apr to final event. CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE, TEWA, H-24 to H+3, slight to moderate. H+3 to D+5, moderate to heavy.	
	M/V HORIZON, DE 534, DE 365	TED/URR-13, UHF ship to air circuit, channel E	225-400 MC	Same events. H+6 to end of Proj. 2.64 aerial survey, intermittent heavy.	

SECTION VI - E

RADIO REQUIREMENTS BY PROJECTS (Cont'd)

Project	Instrument Location	Type of Service or Equipment	Frequency	Traffic Load	Remarks
2.62 cont'd	M/V HORIZON	Facsimile receiver. Weather & fall-out predictions.	2096, 3160, 5255.5, and 5306 KC	15 Apr to final event	Receiver to be furnished and installed by SIO.
	M/V HORIZON	Drogue to ship Radar AN/SSQ-2B(sonar buoys)	4412.5 KC 9036.4 MC 170.5 MC	1 Apr to final event-moderate	Equipment furnished by SIO
2.63	YAG-39 YAG-40 LST-611 Program 2 Control Center	Surface communications net. Channel D	2-18 MC	CHEROKEE, ZUNI, FLATHEAD, NAVAJO, & TEWA, H-6 to H-1 heavy, H to H+8 heavy. Other times light. D-2 first shot to end.	
	YAG-39 YAG-40 LST-611	AN/URR-13 UHF ship to air circuit, Channel E	225-400 MC	During test, intermittent. H-4 to H+2, none.	
	Proj Off. - ELMER Tent #4 - NAN YFNB 13 YFNB 29 YC barge ATF SIOUX	DOD Net 4 VRC-18 Rx and Tx Channel F	53.6 MC	1 Apr to final event	See Notes 1, 2, and 3.
2.64	4 P2V5 aircraft, Bldg 218	AN/URR-13 UHF ship to air circuit, Channel E	225-400 MC	During test series, intermittent; H-4 to H+2, none.	

(Continued)

SECTION VI - E

RADIO REQUIREMENTS BY PROJECTS (Cont'd)

Project	Instrument Location	Type of Service or Equipment	Frequency	Traffic Load	Remarks
2.64 (cont'd)	4 P2V5 aircraft Program 2 Control Center	C.1A1/6A3 communications, Channel C	3088 KC and 6745.5 KC	CHEROKEE, ZUNI, FLATHEAD, NAVAJO, APACHE, TETON, Hdq to DAO continuous during day.	See Note 4.
2.65	None				
2.66	Project aircraft	air to air direction	305.4 MC		Assigned by CIC 7.4.
2.7	Use Project 2.63 facilities.				
2.8	Use Project 2.63 facilities.				
2.9	Use Project 2.63 facilities.				
2.10	YAG-39 YAG-40 LST-611 Bldg223 ELMER Tent 23 ELMER pier	DOD Net 4, Channel F	53.6 MC	Throughout tests, intermittent.	See Notes 1, 2, and 3.
	YAG-39 YAG-40	Remote control	30.133 MC 32.089 MC	Emergency use only.	For remote control of one YAG by other. Must be between 30-42 MC if these 2 cannot be approved.
	Use Project 2.63 facilities.				

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NOTES:

Note 1: DUKW's and LCM's will have installed radio equipment with two channels - one for the Boat Pool and another which can be set to coincide with DOD Net #4.

Note 2: Portable sets tuned for DOD Net #4 are available at radio pool on an "as required" basis. There will be no permanently assigned vehicular mounted radio sets.

Note 3: DOD Net #4 equipment will have a maximum range of about 30 miles.

Note 4: Back-up communications can be provided through the following TG 7.3 channels:

Voice - TG 7.3 Channel 5 = TG 7.3 HF Voice Common.
CW - TG 7.3 Channel 4c = TG 7.3 Voice Common.

SECTION VI - E

RADIO REQUIREMENTS BY CHANNELS

Channel Designation		Frequencies	Type of Service	Instrument Location (15Feb →)	Status P-Pending A-Approved
Program 2 Control Center	CTG 7.3				
A	14	[illegible] nights 6693KC days	Telemeter	P2V5&s, #1 and #3, Control Center, Bldg 218 on ELMER.	P
B	15	315[illegible] nights 6708KC days	Telemeter	P2V5's, #2 and #4, Control Center, Bldg 218 on ELMER.	P
C	12	3088 KC and 6745.5 KC	CW, Voice	4 P2V5's, Control Center, and AOC.	A
	5	TG 7.3 Voice Common	Backup, Voice		
	4C	TG 7.3 Voice Common	Backup, CW		
D	11	2-18 MC	Communications	YAG-39, YAG-40, LST-611, M/V HORIZON, DE-534, DE-365, Control Center.	P
E	13	225-400 MC	Air to ship communications	4 P2V5's, YAG-39, YAG-40, LST 611, M/V HORIZON, DE-534, DE-365, Bldg 218 on ELMER.	P
F		53.6 MC	DOD Nev #4 (See Note 3)	SIO vessels (PB, LCU, LCM, M/V HORIZON), SIOUX, Control Center, DE-534, DE-365, YAG-39, YAG-40, LST-611, YFNB-13, YFNB-29, YC, 1 skiff, Bldg 223-Rm 7 on ELMER (2.10) Proj 2.63 Office on ELMER, Tent #4 on NAN(2.63), Tent #23 on ELMER pier(2.10), Portable sets from radio pool installed in DUKW's and LCM's.	A
		223-229MC	Telemeter	Transmitter in Proj 2.61 rockets. Receivers at Bldg 70 on NAN, and USS KNUDSON.	A

SECTION VI - E

RADIO REQUIREMENTS BY CHANNELS (Cont'd)

Channel Designation		Frequencies	Type of Service	Instrument Location	Status F-Pending A-Approved
Program 2 Control Center	CTG 7.3				
		3000 KC	BC-610 Transmitter, R-390/URR Receiver.	Transmitter in Proj 2.61 rockets. Receivers at Bldg 70, NAN, and USS KNUDSON.	A
		309.4 MC	Air to Air Comm.	Proj 2.66 aircraft (to be assigned by CTG 7.4).	A
		4412.5 KC	Drogue to ship.	Transmitters on Proj 2.62 drogues, receiver on M/V HORIZON.	F
		170.5 MC	Drogue to ship.	Proj 2.62 sonar buoys and M/V HORIZON.	F
		2096, 3160, 5255.5, 5306 KC	Facsimile Receiver.	Receiver on M/V HORIZON.	N/A
		9036.4 MC	Radar	M/V HORIZON	F
		30.133 MC 32.089 MC	Remote control	In YAG's 39 and 40. For emergency use only, for remote control of one YAG by the other. Must be between 30 and 42 MC if these two cannot be approved	I

NOTE: All transmissions to ZI and distant points will be through CJTF 7 circuits.

SECTION VI - F

TELEMETER REQUIREMENTS

PROJECT	FREQUENCY	LOCATION		EVENT	TIME
		TRANSMITTER	RECEIVER		
2.1	NONE				
2.2	NONE				
2.4	NONE				
2.51	NONE				
2.52	NONE				
2.61	223 MC 224 MC 225 MC 226 MC 227 MC 228 MC 229 MC	Head of atmospheric sounding vehicles	a. USS HUDSON about 35 mi from GZ. b. NAN, Bldg 70. (Note: 2 pr hard wire required from launching revetment on HCM to Bldg 70 on NAN)	CHEROKEE ZUNI FLATHEAD HURON NAVAJO TEWA	H#5 min to H#25 min.
2.62	NONE				
2.63	NONE				
2.64	HF Voice Channel A	P2V acft #1 and #3	Program 2 Control Center.	CHEROKEE ZUNI FLATHEAD NAVAJO APACHE	H#2 to D#6 continuous during daylight hours.
	HF Voice Channel B HF Voice	P2V acft #2 and #4	Program 2 Control Center	do	do
	Channel A and B	None - Transmit from acft during calibration	Bldg 218 - ELMER	Calibration and test prior to and during above events.	Continuous during calibration. Intermittent throughout operation. No transmission H-4 to H#2
	do	Bldg 218 - ELMER	None - To acft during calibration	do	do
2.65 to 2.10 have no Telemeter Requirements					

SECTION VI - G

TIMING SIGNAL REQUIREMENTS

Project	Event	Signals	Location	Remarks
2.1	None			
2.2	CHEROKEE	-15 min, -15 sec	ABLE Station 221.01 and CHARLIE Station 221.02.	Hard wire or radio normally open to close at these times.
	FLATHEAD APACHE NAVAJO HURON	-1 min, -1 sec	DOG Station 221.03 EASY Station 221.04 FOX Station 221.05 GEORGE Station 221.06 DOG Bunker Station 222.01 GEORGE Bunker Station 222.02	
	ZUNI	-1 min, -1 sec	OBOE Station 220.08 PETER Station 220.14 ROGER Station 220.09	
2.4	None			
2.51	None			
2.52	None			
2.61	CHEROKEE ZUNI FLATHEAD HURON NAVAJO TEWA	Voice count down	On USS KNUDSON	
	CHEROKEE	-1 min, -2½ sec (2 blue boxes)	HOW launcher area, Station 261.01 and NAN Island, Bldg 70, Station 262.01	
	ZUNI NAVAJO FLATHEAD HURON TEWA	-1 min, -1 sec (2 blue boxes ea)		
2.62	None			

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SECTION VI - G

TIMING SIGNAL REQUIREMENTS (Cont'd)

Project	Event	Signals	Location	Remarks
2.63	CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	Voice ±½ sec accuracy. Long range time if available.	YAG's 39 and 40, and LST 611	
	ZUNI FLATHEAD NAVAJO TEWA	-1 sec hardwire	HOW Station 266.02	
	CHEROKEE CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	-2½ sec 4 EG&G blue boxes	HOW Station 266.02 2 YFNB in Bikini Lagoon	2 blue boxes on each YFNB
	CHEROKEE ZUNI FLATHEAD NAVAJO TEWA	-2½ sec radio signal -1 sec radio signal	2 YFNB in Bikini Lagoon 2 YFNB in Bikini Lagoon	
		3 additional blue boxes	Bikini Atoll Islands	
2.64	None			
2.65	ZUNI FLATHEAD NAVAJO TEWA	44 EG&G blue boxes	4 ea on CHARLIE, OBOE, HOW, YOKE 3 ea on GEORGE, VICTOR, NAN, UNCLE 2 ea on DOG, FOX, LOVE, BRAVO, ABLE, COCA 1 ea on WILMA, BRUCE, LEROY, MACK	Plus such spare blue boxes as needed.

SECTION VI - G

TIMING SIGNAL REQUIREMENTS (Cont'd)

Project	Event	Signals	Location	Remarks
2.65 Cont'd)	ZUNI FLATHEAD NAVAJO TEWA	-1 min or -15 sec hardwire.	1 ea on FOX 269.01 GEORGE 269.02 OBOE 269.03 UNCLE 269.04	Radio signal if wire not available.
2.66	None			
2.7	Will use Project 2.63 signals.			
2.8	None			
2.9	None			
2.10	Will use Project 2.63 signals.			

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SECTION VI - G

VOICE TIMING SIGNALS

FREQUENCIES: 245.0 MC.....Aircraft
168.975 MC.....TG 7.3 Administrative Net.
154.47 MC.....Voice count-down frequency.

CALL. Eniwetok operations - "Manhunt"
Bikini operations - - "Barrymore"

ORIGIN: For air drops. Timing from drop aircraft on 245.0 MC.
Count-down from firing bunker on 154.47 MC and 168.975 MC.

All others. Simultaneous broadcast from firing bunker on 154.47 MC, 168.975 MC, and 245.0 MC.

Safety information to be inserted on individual channels from other origin.

SCRIPT:

Time	Count-down
H-2 hrs	-1 min, -30 sec, -10 sec, -5, -4, -3, -2, -1, hack.
H-1½ hrs	do
H-1 hr	-1 min, -30 sec, -10 sec, -5, -4, -3, -2, -1, tone.
H-45 min	do
H-30 min	do
H-15 min	do
H-14 min	-30 sec, -10 sec, -5, -4, -3, -2, -1, tone.
H-13 min	do
H-12 min	do
H-11 min	do
H-10 min	do
H-9 min	do
H-8 min	do
H-7 min	do
H-6 min	do
H-5 min	do
H-4 min	do
H-3 min	do
H-2 min	do
H-1 min	do
H-30 sec,	-25 sec, -20 sec, -15 sec, -10 sec, -9, -8, -7, -6, -5, -4, -3, -2, -1, tone.

SECTION VI - H

TELEPHONE REQUIREMENTS

PROJECT	TYPE	LOCATION	INSTALLATION
2.1	Desk	ELMER Compound, Office-lab tent	Direct line.
2.2	Desk	ELMER Compound, Office, Bldg 211, Rm K	Direct line.
	Desk	ELMER Compound, Lab, Bldg 211, Rm E	Ringing extension on above.
2.4	Desk	ELMER Decontamination Area, tent	Direct line.
2.51	Desk	ELMER Compound, Office, tent	Direct line.
	Wall or desk	ELMER Compound, trailer #1	Direct line.
	Wall or desk	ELMER Compound, trailer #2	Ringing extension on above.
2.52	Desk	OBOE Station 102, shelter	Direct line.
2.61	Desk	NAN Office tent #1	Direct line.
	Desk or wall	HCW Launch revetment, tent	Direct line.
2.62	Desk	ELMER, Office tent	Direct line.
2.63	Desk	ELMER Compound, Office tent	Direct line.
	Desk	ELMER Compound, Office Bldg 223, Rm 10	Direct line.
	Desk	ELMER Compound, Lab space, Bldg 223, Rm 9	Ringing extension on above.
	Desk	ELMER Compound, Lab space, Bldg 223, Rm 8	Ringing extension on above.
	Desk	Project Trailer ELMER Compound	Direct line.
	Desk	Project Trailer ELMER Compound	Direct line.
	Desk or wall	ELMER Island Beach	Direct line.
	Desk	NAN Compound, Office tent	Direct line.
	Desk	Work tent, NAN Compound	Ringing extension on above.
	Desk	Work-storage tent, NAN Compound	Ringing extension on above.

(Continued on next page)

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TELEPHONE REQUIREMENTS (Cont'd)

PROJECT	TYPE	LOCATION	INSTALLATION
2.63 (Cont'd)	Desk or Wall	NAN Beach, Office	Direct line.
	Desk	Work Tent - NAN Beach	Ringing extension on above.
	Desk	FRED, Office, Bldg 117A	Direct line.
2.64	Desk	EIMER Office tent adjacent Bldg 218. (South side)	Direct line.
	Wall	EIMER, trailer #1 adjacent Bldg 218.(South side)	Ringing extension on above.
	Desk	ELMER, Lab space, Bldg 218	Ringing extension on above.
2.65	Desk	ELMER Compound, Office-Lab space, Bldg 223, Rm 4.	Direct line.
	Desk or Wall	ELMER Compound, Office-Work tent	Direct line.
	Desk or Wall	ELMER Compound, trailer.	Ringing extension on above.
	Desk or Wall	NAN Compound, Office-work tent	Direct line.
2.66	Desk	FRED, Office, Bldg 633.	2 Direct lines (2 interconnected).
	Desk	FRED, Office, Bldg 640.	Direct line w/2 extensions in trailer.
2.7	Desk	ELMER Compound, Office, Bldg 223, Rm 5	Direct line.
2.8	Desk	ELMER Compound, Bldg 223, Rm 7	Direct line.
	Desk	ELMER, Office tent.	Direct line.
	Desk	EIMER, Processing Bldg Contaminated Area.	Direct line
2.10	Desk	ELMER, near Personnel Pier, Office tent.	Two direct lines.
	Desk	ELMER, near Personnel Pier, Ships Office tent	One direct line. Two extensions.
	Desk	NAN Compound, Rad Safe tent.	Direct line.

SECTION VI - J

SPECIAL COMMUNICATIONS REQUIREMENTS

PROJECT	TYPE	LOCATION	REMARKS
2.61	2 pair hard wire	HOW launching revetment to NAN Bldg 70	To transmit launching signals from launcher to receiver at NAN.
2.61	3 pair hard wire	HOW launch revetment to HOW photo tower	For starting cameras from local sequence timer.
2.62	Cryptographic Equipment AFSAM-7	M/V HORIZON	OPERATORS - CAPT and 1st MATE One scientific person.

SECTION VI - K

SAMPLE RETURN REQUIREMENTS BY FIXED WING AIRCRAFT

PROJECT	NO. BOXES WT(lbs total) VOL(cu ft total) OF SAMPLES	COURIER REQUIRED	TIME AFTER SHOT	CHEROKEE	ZUNI	FLATHEAD	NAVAJO	APACHE	SEMINOLE	LACROSSE	HURON	TEWA	DESCRIPTION, DESTINATION
RETURN OF SAMPLES TO ZI:													
2.4	1-60-1	Yes, will use Proj 2.65 Courier	D+6	X	X		X						Fall-out samples. Max 100 mr/hr at 1 ft from surface. Should arrive Friendship Airport, Baltimore, Md not later than D+8.
*2.63	4-420-120	Yes**	D+1 to D+2	X	X	X	X					X	Fall-out samples. Max 200 mr/hr at 1 ft from surface. Should arrive NRDL, San Fran D+3 or as soon as possible.
*2.63	20-1700-450	Yes**	D+4 to D+5	X	X	X	X					X	Fall-out sample. Max 200 mr/hr at 1 ft from surface. Should arrive NRDL, San Fran D+6 or as soon as possible.
2.64	4-300-32	No	D+4	X	X	X	X	X				X	Water samples. Max 200 mr/hr at 1 ft from surface. Should arrive HASL/AEC New York on D+7.
2.65	10-1500-80	Yes**	D+4 or*** D+5	X	X	X	X					X	Fall-out samples. Max 100 mr/hr at 1 ft from surface. Should arrive Friendship Airport, Baltimore, Md. Not later than D+8
2.65	1-200-5	Yes	H+36	X	X	X	X			X		X	Fall-out samples. Max 100 mr/hr at 1 ft from surface. Should arrive Friendship Airport, Baltimore, Md. Not later than D+4½.
2.66	1-50-2	No	H+30 to D+5	X	X	X	X					X	Urine samples. Max 1 mr/hr 1 ft from surface. To be delivered to H-4 Division LASL.

SECTION VI - K

SAMPLE RETURN REQUIREMENTS BY FIXED WING AIRCRAFT (Cont'd)

PROJECT	NO. BOXES WT(lbs total) VOL(cuft total) OF SAMPLES	COURIER REQUIRED	TIME AFTER SHOT	CHEROKEE	ZUNI	FLATHEAD	NAVAJO	APACHE	SEMINOLE	LACROSSE	HURON	TEWA	DESCRIPTION, DESTINATION
INTER-ATOLL SAMPLE TRANSFER													
2.1	1-50-2	Yes**	H+48	X	X	X	X	X			X		Film dosimeters from NAN to ELMER. Max 10 mr/hr at 1 ft from surface. Should arrive ELMER H+50.
2.51	1-100-10	Yes**	H+12	X									Neutron detectors from NAN to ELMER. Max 200 mr/hr at 1 ft from surface. Should arrive FRED air strip not later than H+14.#
2.63	3-340-90	Yes**	H+15 to H+20	X	X	X	X					X	Fall-out samples from NAN to ELMER. Max 200 mr/hr at 1 ft from surface. Should arrive ELMER by H+17 to H+22.#
2.63	4-490-120	Yes**	D+2 to D+3	X	X	X	X					X	Fall-out sample from NAN to ELMER. Max 200 mr/hr at 1 ft from surface. Should be delivered to ELMER.#
2.65	4-20-24	Yes**	H+12	X	X	X	X					X	Fall-out samples from NAN to ELMER. Max 200 mr/hr at 1 ft Should arrive ELMER not later than H+15.#
2.65	20-1000-200 2-200-20 10-50-60 1-100-30 4-100-8	Yes**	H+48	X	X	X	X					X	Fall-out sample from NAN to ELMER. Max 200 mr/hr at 1 ft from surface. Should arrive ELMER not later than H+51.
2.65	2-200-6	Yes**	D+3	X	X							X	Fall-out samples from Rongerik to FRED. Max 100 mr/hr at 1 ft from surface.

* Urgent
** Project will furnish courier
*** 1 flight 30 days after last Bikini shot.
# Will require helicopter or L20 from FRED to ELMER.

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SECTION VI - K

SCHEDULE OF SAMPLE RETURN AIRCRAFT (Cont'd)

Departures from FRED:	Destination
H+6 to H+10	First either to Alameda NAS or Kirtland AFB (depending on whether UCRL or IASI shot) thence to other destinations as required.
H+24 to H+36	First to Alameda NAS then to Kirtland AFB, Friendship Airport, Baltimore, Md., Mitchell AFB, N.Y. and others as required.
D+4 to D+5	May be a MATS flight. To destination as required.

It should be noted that shot schedules may cause the D+4 to D+5 flight for one shot to be the same flight as the H+6 to H+10 flight for the succeeding shot, etc.

SECTION VI - L

TRAILER DATA

Description and Number	Size-Ft LxWxH	Wt. Ton	Arrival Date	Location	Ready Date	Power V	Power Ø	Power KW	Gal Fuel Day	Water Gal/Day
Project 2.1										
1 Photo	30x8x11	6	TU7 Spec	Ship TU7 Spec	TU7 Spec	220 AC	Site 3	60Amp/Ø		100
1 Semi	26x8x11	7	15 Feb	ELMER Calibration Range	CHEROKEE -30 days	110 AC	Site 1	10		
Project 2.2										
1 Instrument	26x8x11	7	15 Feb	ELMER Compound	CHEROKEE -30 days	110 AC	Site 1	13		
1-Two wheel	12x6x6	1	15 Feb	ELMER Compound	CHEROKEE -30 days	User Gener 110 AC	1	3	20	
Project 2.51										
1 Counting	38x9x12	10	21 Mar	ELMER near 2.65 trailer	1 Apr	220 AC	Site 3	150 Amp/Ø		60 with sewer
1 Counting	24x8x12	10	1 Apr	ELMER near 2.65 trailer	1 Apr	220 AC	Site 3	100 Amp/Ø		60 with sewer
Project 2.62										
1 Ocean Analysis	24x8x11	4	1 Mar	SIO LCU at Bikini	15 Mar	DC converter 110	1	10		50

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SECTION VI - L
TRAILER DATA (Continued)

Description and Number	Size-Ft LxWxH	Wt. Ton	Arrival Date	Location	Ready Date	Power V	Power ø	Power KW	Gal Fuel Day	Water Gal/Day
Project 2.63										
2 Laboratory	27x7x11	6	8 Apr	ELMER Compound	15 Apr	110 AC	Site	60 10		10
Project 2.64										
1 Instrument	28x8x12	6	1 Apr	ELMER, adjacent Bldg 218	CHEROKEE -14 days	220	Site	60 10	Gas	20
Project 2.65										
1 Laboratory	27x9x12	10	1 Apr	ELMER Compound	CHEROKEE -30 days	220 AC	Site	3 100Amp/ ø		300 with sewer
Project 2.66										
1 Photo	28x8x12	13	10 Apr	FRED adjacent Bldg 640	CHEROKEE -15 days	220/ 110	Site	1 100		150 with sewer
						Contractor				
						220/ 110	3	60Amp/ ø		
1 Analysis	28x8x12	6	10 Apr	FRED adjacent Bldg 640	CHEROKEE -15 days	220/ 110	Site	3 60Amp/ ø		

PART VII

PERSONNEL & SECURITY

EVERY MAN A TIGER

SECTION VII - A

ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
ABBOT, Richard D.	Pvt, USA	US56256797	Secret	2.51	ACC	8 Apr	
ADAMS, Charles E.	GS-12		Q-WA-16154	2.63	NRDL	1 Apr	1 Jul
ALVAREZ, Ernest L.		967-07001		2.63	NRDL	1 Apr	1 Jul
AMES, Michael R.*			Secret	2.62	SIO	Mar	
AMES, Oscar (NMI)			Secret	2.62	SIO	Mar	
ARMSTRONG, Woodrow J.	GS-14		Q-WA-26123/MTS	2.10	NRDL	31 Mar	19 Jul
BACKMAN, George E.	GS-12 equiv		Q-HA-8663	2.10	NRDL	9 Apr	25 Jun
BALL, Laverl N.*	CECN	369 92 52	M/Secret	2.61	NRDL	12 Mar	25 Jun
BANKS, James E.	1stLt,USAF	AO 2228627	T/S	2.66	AFSWC	10 Apr	
BARNETT, Benjamin (NMI)*	GS-14		Secret	2.51	ACC	8 Apr	
BARTON, Frank C.				2.62	SIO	Mar	
BAUM, Sanford (NMI)	GS-11		Q-WA-35838	2.63	NRDL	1 Apr	1 Jul
BECKMAN, Arthur R.	GS-8 equiv		M/Secret	2.63	NRDL	24 Mar	1 Jul
BELL, Melvin A.	SW1, USN	799 07 30	M/Secret	2.63	NRDL	24 Mar	1 Jul
BERMAN, Arnold (NMI)	Sp3, USA	US51303313	Secret	2.65	ACC	18 Mar	
BERTO, Andrew L.(alter)	GS-8 equiv		M/Secret	2.63	NRDL	15 Mar	
BIGGER, Michael M.	GS-13		Q-WA-15353	2.10	NRDL	17 Mar	26 Jul
BLACK, Robert H.	GS-9		Q-WA-41963	2.8	NRDL	15 Apr	2 Jun
BLATNER, Robert E.	GS-9 equiv		M/Secret	2.7	NRDL	8 Apr	15 Jul
BLONDO, Clemence J.(alter)		967-06985		2.63	NRDL		
BOETEL, Emil E.		967-07078		2.63	NRDL	1 Apr	1 Jul
BOUTON, Edwin H.	GS-13		TS/Q-WA-3982	2.51	ACC	13 Jun	7 Jul
BRACE, Charles L.	Pfc, USA	US51327291	Secret	2.51	ACC	8 Apr	
BRATZ, Arthur E.N.			Secret	2.62	SIO	Mar	
BRENNAN, Robert E.			Secret	2.62	SIO	Mar	
BROWN, Daniel M.			Secret	2.62	SIO	Mar	
BROWN, Frank E.*	SV3, USN	369 90 57	M/Secret	2.61	NRDL	12 Mar	25 Jun
BROWN, Glen D.	GS-12 equiv		Q-HA-16338	2.10	NRDL	18 Jun	26 Jul

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SECTION VII - A

ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
BROWN, Peter (NMI)*	GS-14		Q-NA-25835/TS	2.2	ESL	10 Apr	
BUSSMAN, Floyd C.			Secret	2.62	SIO	Mar	
CAMPBELL, Charles E. (alter	GS-11 equiv		M/Secret	2.7	STIS		
CAMPBELL, Donald C.*	CDR, USN	109094	T/S	Prog 2	TU-3	25 Mar	
CANTOR, Gilbert				2.2	ESL		
CARPENTER, Wilbur D.*	RU3, USN	965 30 42	M/Secret	2.61	NRDL	12 Mar	25 Jun
CARTER, Lyle A.	GS-12 equiv			2.61	NRDL	1 Jun	31 Jul
CARUBA, Walter E.	GS-8		T/S	2.2	ESL	27 May	
CASSIDY, Melvin E.	GS-11		Q-NY-8635	2.64	ACC	15 Apr	
CHAN, Harry K.	GS-9		Q-NA-58007	2.63	NRDL	24 Mar	1 Jul
CHANDLER, Julian A.C. II				2.62	SIO	Mar	
CHAPMAN, John E.				2.62	SIO		
CHERBOURIER, Edward (NMI)	GS-9		T/S	2.10	NRDL	9 Apr	26 Jul
CHIMENT, John A.*	Maj, USA	027048	T/S	Prog 2	TU-3	25 Mar	
CROW, Benjamin (NMI)	GS-11		M/Secret	2.63	NRDL	1 Apr	1 Jul
CRAMPITT, Clanton W. Jr.			Secret	2.62	SIO	Mar	
CLARK, Geoffrey C.			Secret	2.62	SIO	Mar	
COMEFORD, Arnold (NMI)	PFC, USA	US51312395	Secret	2.65	ACC	30 Mar	
CONGER, Kenneth R.			Secret	2.62	SIO	Mar	
CONINE, Robert D.*	PFC, USA	US56246754	Secret	2.65	ACC	20 Mar	
COOK, Theophile J.	SN, USN	459 61 89	M/Secret	2.63	NRDL	24 Mar	1 Jul
COOPER, Eugene P.	GS-15		Q-NA 97437	2.63	NRDL	10 Jun	30 Jun
COSTELLO, James P. Jr.			I/S	2.62	SIO	Mar	
COVELL, David F.	GS-12		Q-NA-701	2.63	NRDL	1 Apr	30 May
COVEY, Elwin H.	GS-11		Q-NA-72289	2.63	NRDL	1 Apr	1 Jul
COWAN, Maynard			Q-SA-7879	2.52	SC	19 Apr	
CREW, Robert J.	GS-11		Q-NA-24046	2.8	NRDL	15 Apr	2 Jun
CRISCO, Carl (NMI) Jr*	PFC, USA	US52372626	Secret	2.65	ACC	18 Mar	

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SECTION VII - A

ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
CROTCHFELT, Joseph H.	WB-20		Secret	2.1	ESL	10 Apr	
CRUMLEY, Paul M.*	Capt, USAF	16379A	Q-WA-60950/TS	2.66	AFSWC	30 Mar	
CURRY, Albert M. Jr.(alt)	GS-9 equiv		M/Secret	2.7	NRDL		
CURTIS, Harold B.	ENS, USNR	593801	M/Secret	2.10	NRDL	2 Apr	19 Jul
DALE, Allen R.	GS-9		Q-WA-26724/MS	2.10	NRDL	2 Apr	24 May
DALGREN, Herbert (NMI)			Secret	2.62	SIO	Mar	
DASHNEY, Gary A.*	SV3, USN	420 93 94	M/Secret	2.61	NRDL	12 Mar	25 Jun
DENNAGER, Edward J.			Secret	2.62	SIO	Mar	
DEVLIN, Frank A.	GS-9		Q-24052/MS	2.10	NRDL	14 May	25 Jun
DHEIN, Ernest H.	GS-13		Q-78496/TS	2.4	ACC	10 Jun	30 Jun
DICK, James L.*	Capt, USAF	17906A	Q-WA-93487/TS	2.66	AFSWC	10 Apr	
DUGAS, Davis R.	BM2, USN	274 84 33	MTS	2.61	NRDL	24 Mar	1 Jul
DUMA, Ira N.	SN, USN	459 19 58		2.63	NRDL	24 Mar	1 Jul
EASON, John R.	GS-9 equiv		M/Secret	2.7	NRDL	8 Apr	15 Jul
EBEL, Melvin L. (alter)	GS-9 equiv		Q-WA-20860	2.63	NRDL		
EDDY, Terrel R.			Secret	2.62	SIO	Mar	
EGEBERG, Lansing E.	GS-11		M/Secret	2.63	NRDL	1 Apr	1 Jul
EKLUND, Melvin H.	ENS, USNR	593841	M/Secret	2.61	NRDL	25 Mar	20 May
ELLSTROM, Eric C.*	GS-11		Q-WA-51536	2.2	ESL	21 Apr	
ENDSLEY, David L.	2ndLt, USAF	A03030976T	ITS	2.66	AFSWC	5 Apr	
ENGQUIST, Elmer H.*	GS-14		Q-61478	2.51	ACC	22 Apr	
ERNST, Lloyd E.	HM1, USN	329 27 68	M/Secret	2.10	NRDL	9 Apr	26 Jul
EVANS, Evan C., III	GS-12		Q-NA-372	2.63	NRDL	24 Mar	1 Jul
EVANS, Frank L. (alter)	GS-8		M/Secret	2.63	NRDL		
FABER, Fred E. (alter)	GS-9 equiv		M/Secret	2.7	NRDL		
FALKNER, Garth E.			Secret	2.62	SIO	Mar	
FARLOW, Neil H.	GS-11		Q-WA-35897	2.63	NRDL	15 May	1 Jul
FLEMING, Charles S.*			Q-WAZ-51152/S	2.62	SIO	Mar	
FLETCHER, Irvin D.	HM3, USN	443 02 99		2.10	NRDL	9 Apr	26 Jul

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SECTION VII - A

ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
FITE, Donald W.	Contractor		M/Secret	2.61	NRDL	25 Mar	25 Jun
FITZGERALD, Thomas T.*	CE3, USN	442 83 92	M/Secret	2.61	NRDL	12 Mar	25 Jun
FOLSOM, Theodore R.*			Q-WAZ-51153/S	2.62	SIO	Mar	
FORSYTH, Northern H.	Pvt, USA	US53261201	Secret	2.4	ACC	20 Mar	
FOTI, Stephen C.	GS-9		M/Secret	2.63	NRDL	1 Apr	1 Jul
FRANCIS, Arthur B.*	Pfc, USA	US55462211	Secret	2.51	ACC	1 Mar	
FRENCH, Edwin R.	GS-5		Q-NY-15144	2.64	AEC	3 May	
FRENCH, Fredrick A.	GS-11		Q-WA-39870	2.63	NRDL	1 Apr	1 Jul
FRENCH, John M.			Secret	2.62	SIO	Mar	
FRENCH, Orrin A.	GS-9 equiv		M/Secret	2.7	NRDL	8 Apr	15 Jul
FRESE, Gildo Valentino	Pvt, USA	US51319124	Secret	2.51	ACC	18 Mar	
FUGATE, Bedford L.	SN, USN	456 85 05	M/Secret	2.63	NRDL	24 Mar	1 Jul
FULLER, Ross K.	GS-9		Q-WA-40947	2.8	NRDL	15 Apr	30 Jun
FULLER, Wilson F.	ET1, USN	247 29 36	M/Secret	2.63	NRDL	1 Apr	1 Jul
FUNSTON, Herbert O.	2ndLt,USA			2.4	ACC	25 Apr	16 Jun
GALLAS, William (NMI)	WB-20		Secret	2.2	ESL	10 Apr	
GIACALONE, Joseph G.	WB-15		Secret	2.2	ESL	10 Apr	
GILKEY, Robert W.			Secret	2.62	SIO	Mar	
GLAUBERMAN, Harrold (NMI)	GS-9		Q-NY-19530	2.64	AEC		
GORDON, Malcolm G.	GS-12		Q-WA-37538/TS	2.65	ACC	5 May	
GRAVESON, Robert T.	GS-13		Q-NY-1357	2.64	AEC	27 May	
GROTE, Horrell H.*	BUL1, USN	456 48 66	M/Secret	2.61	NRDL	12 Mar	25 Jun
GUAY, Albert J.	GS-7 equiv		Q-WA-20616	2.8	NRDL	15 Apr	30 Jun
GUSTAFSON, Donald J.	GS-7 equiv		M/Secret	2.8	NRDL	15 Apr	30 Jun
HALL, William F., Jr.	GS-9		Secret	2.65	ACC	30 Mar	
HAMADA, Gerald H.	GS-5		Q-NY-27260	2.64	AEC	29 Apr	
HAMPTON, William L.	SWCA, USN	231 62 66		2.63	NRDL	24 Mar	1 Jul
HAMMOND, Charles E.	GS-9 equiv		M/Secret	2.10	NRDL	9 Apr	25 Jun
HANSON, Terry (NMI)			Secret	2.62	SIO	Mar	

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SECTION VII - A

ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL(Cont'd)

Name Last, First, Initial	Rank or Grade	Service Number	Security Clearance	Project	Agency	Arrival Date	Departure Date
HARDIN, Luther M.*	GS-12		Q-WA-53824/TS	2.65	ACC	13 May	
HARLEY, John	GS-15		Q-57657-NY	2.64	AEC		
HARLOW, Marvin V. Jr.	2d Lt,USAF	A02206602	T/S	2.66	AFSWC	10 Apr	
HASKELL, Irwin (NMI)	GS-7		Q-NY-19755	2.64	AEC	15 Apr	
HAWKINS, Myron "B"	GS-14		Q-WA-13074	2.10	NRDL	17 May	19 Jul
HEISKELL, Raymond "H"	GS-12		Q-WA-24417	2.8	NRDL	15 Apr	2 Jun
HERMAN, John J.*	CE3, USN	434 99 33	M/Secret	2.61	NRDL	12 Mar	25 Jun
HERON, Donald J.	GS-11		M/Secret	2.10	NRDL	9 Apr	25 Jun
HARWIT, Martin O.	PVT, USA	US55299076	Secret	2.51	ACC	8 Apr	
HEWITT, Charles A.	SP3, USA	US51317180	Secret	2.65	ACC	20 Mar	
HOIMLUND, Gordon W.	GS-9 equiv		M/Secret	2.7	NRDL	8 Apr	15 Jul
HOOLEY, Francis E.	ET3, USN	453 12 99	M/Secret	2.63	NRDL	1 Apr	1 Jul
HOPKINS, Marvin F.			Secret	2.62	SIO	Mar	
HORD, John d'H	Maj, USAF	A0320900	Q-WA13220/TS	2.66	AFSWC	10 Apr	1 Jun
HORNER, Paul L.*			Q-WA-86526/S	2.62	SIO	Mar	
HUBBARD, Edgar Q.*	SVC, USN	393 43 96	M/Secret	2.61	NRDL	12 Mar	25 Jun
HUFFER, Robert P.*			Q-WA-78578/S	2.62	SIO	Mar	
HUNTER, Homer A.	SWCN,USN	453 10 73	M/Secret	2.63	NRDL	24 Mar	1 Jul
HURLEY, Thomas J. Jr.*	GS-9		Secret	2.1	ESL	1[illegible] Mar	
HUTCHINSON, John G.	PFC, USA	US51263824	Secret	2.65	ACC	20 Mar	
ISAACS, John D. III*			Q-WAZ51155/S	2.62	SIO	Mar	
IRWIN, Carl K.	GS-12equiv		Q-HA-30427	2.10	NRDL	18 Jun	26 Jul
JENNINGS, Cecil D.			I/S	2.62	SIO	Mar	
JENNINGS, Feenan D.*			Q-WA-78580/S	2.62	SIO	Mar	
JOHNSON, John P.*	PFC, USA	US54161002	Secret	2.65	ACC	18 Mar	
JOHNSON, Ockle E. Jr.*	PFC, USA	US52383596	Q-WA77183/S	2.1	ESL	10 Apr	
JOHNSON, Richard L.	ETSN,USN	319 36 23		2.63	NRDL	1 Apr	
KAERICHER, Kermit C.*	CAPT,USAF	17608A	Q-WA58656/TS	2.66	AFSWC	20 May	
KASTE, Ray R.	ET3, USN	792 79 88		2.63	NRDL	1 Apr	1 Jul

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
KAWAHARA, Francis K.	GS-9		Q-NA-26730	2.8	NRDL	15 Apr	2 Jun
KEARNS, James J.	GS-14		Q-AEC63653/MTS	2.10	NRDL	2 Apr	19 Jul
KILLION, Lawrence E.*	Capt, USAF	17046A	T/S Q-DB806	Prog 2	TU 3	18 Mar	
KINCH, John M.	GS-9		Secret	2.51	ACC	18 Mar	
KINSEL, Tracy S.	Pvt, USA	US55493054	Secret	2.51	ACC	1 Apr	
KLEVIN, Paul B.	GS-13		Q-37335-NY	2.64	AEC		
KNOWLES, Frederick L.	Pfc	US5238720	Secret	2.65	ACC	18 Mar	
KREY, Philip D.*	GS-12		Q-NA-25865/TS	2.65	ACC	30 Mar	
LA CLAIR, William D.	YN3, USN	345 88 87	I/TS	Prog 2	TU 3	5 Mar	
LACOST, John K.	ET3, USN	442 84 53	M/Secret	2.63	NRDL	1 Apr	1 Jul
LANE, William B.	GS-12		Q-NA-35904	2.8	NRDL	15 Apr	2 Jun
LANEY, Thomas F.			Q-SA-4560	2.52	SC	16 Mar	
LANGENHAGEN, Charles F.	Pvt, USA	US52399749	I/Secret	2.65	ACC	8 Apr	
LAPIC, John R.	Pfc, USA	US52321540	Secret	2.65	ACC	18 Mar	
LARA, Martin J. (alter)	GS-4		M/Secret	2.63	NRDL		
LaRIVIERE, Philip D.	GS-12		Q-NA-380 /NS	2.62	NRDL	1 Apr	1 Jul
LARRICK, Ross G.*	GS-11		Q-NA-65433/S	2.1	NRDL	Apr	
LAU, Joseph E. Jr.	GS-11		Q-NA-45220/NS	2.10	NRDL	9 Apr	26 Jul
LEAHY, Edward J.	GS-9		M/Secret	2.10	NRDL	18 Jun	12 Jul
LEE, Hong (NMI)	GS-11		Q-NA-22793	2.8	NRDL	15 Apr	30 Jun
LEEN, Robert A.	GS-7 equiv			2.8	NRDL	15 Apr	30 Jun
LeVINE, Harris D.	GS-15		Q-NY-27435	2.64	AEC	25 Apr	
LINDBERG, Bobby G.	GS-12 equiv		Q-51947HA	2.10	NRDL	9 Apr	25 Jun
LINDWARM, Joseph (NMI)*	GS-14		Q-AR182/TS	2.51	ACC	29 Apr	
LIPANOVICH, Marko J.	GS-12		Q-NA-42170	2.63	NRDL	24 Mar	30 May
LIST, Dean B.*			Q-WAZ-30913SA	2.52	SC	16 Mar	
LIVINGSTON, Carlton S.			Secret	2.62	SIO	Mar	
LOONEY, Trevor C.			Q-SA-12745	2.52	SC	16 Mar	
LOUIE, Henry (NMI)	GS-11		M/Secret	2.7	NRDL	8 Apr	1 Aug

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, First, Initial	Grade or Rank	Service Number	Security Clearance	Project	Agency	Arrival Date	Departure Date
LUCAS, Jack C.			Secret	2.62	SIO	Mar	
LUKE, Charles W.	Capt, USA	062022	I/S	2.51	ACC	8 Apr	
MACDONALD, Douglas (NMI)(a)	GS-11		Q-WA-11121	2.63	NRDL		
MACKIN, James L.(alternate	GS-11		Q-WA-18626	2.63	NRDL		
MAJESKI, Felix J.	GS-12 equiv		M/Secret	2.10	NRDL	18 Jun	26 Jul
MALONEY, Joseph C.	GS-11		Q-WA-37561	2.4	ACC	8 Apr	
MARKOW, Basil (NMI)	GS-12		Secret	2.1	ESL	21 Apr	
MARMIROLI, Robert G.*	GS-9		Q-WA771S7/S	2.1	ESL	27 May	
MARSHALL, Neil A.(alter)	GS-14		Q-68560/NTS	2.63	NRDL		
MARTIN, De Courcey (NMI)			Secret	2.62	SIO	Mar	
MATHER, James A.			Secret	2.62	SIO	Mar	
McCARTY, Philip F.*	SP3, USA	US51291901	Secret	2.65	ACC	16 Mar	
McISAAC, Joseph P.	SP2, USA	US51306403	Secret	2.65	ACC	30 Mar	
McLAUGHLIN, Austin G.	Contractor		M/Secret	2.61	NRDL	25 Mar	25 Jun
McLAUGHLIN, Junior H.			Secret	2.62	SIO	Mar	
McLAUGHLIN, William L.	PFC, USA	US52377758	Secret	2.1	ESL	10 Apr	
McNEILLY, John H.*	2nd Lt	04037357	I/S	2.65	ACC	20 Mar	
MERIAN, Richard F.	Capt,USAF	A01910556	I/TS	2.66	AFSWC	1 Jun	
MILLER, Lewis D.	GS-9		M/Secret	2.63	NRDL	15 May	
MILLSAP, Dean A.	SP2, USA	RA19475299	Secret	2.65	ACC	18 Mar	
MOFFAT, Robert J.*	CE3, USN	409 77 12	M/Secret	2.61	NRDL	12 Mar	25 Jun
MOLUMPHY, George G.	CAPT,USN		Q-AEC63133/TS	2.10	NRDL	22 Apr	26 Jul
MOCK, George B.	PFC, USA	US53246072	Secret	2.65	ACC	30 Mar	
MORGENTHAU, Manfred (NMI)	GS-13		Q-WA47301/S	2.65	ACC	24 Apr	
MORRIS, William A.	CD2, USN	279 43 37		2.63	NRDL	24 Mar	
MORRIS, William L.(alter)	GS-9 equiv		M/Secret	2.7	SFNS		
MORRISON, William L. Jr.	GS-9		M/Secret	2.63	NRDL	1 Apr	1 Jul
MOULTON, Arthur B.			Secret	2.62	SIO	Mar	
MOYER, Charles B.(alter)	GS-10		M/Secret	2.63	NRDL		

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
NEIL, Kenneth J.	CE3, USN	791 97 78		2.63	NRDL	24 Mar	1 Jul
NIGRO, Nicholas S.	GS-9		Secret	2.2	ESL	18 Mar	
NUCKOLLS, Melvin J.	GS-7		Q-WA-18637/MS	2.63	NRDL	24 Mar	1 Jul
O'BRIEN, Keran P.	GS-9		Q-NY-13061	2.64	AEC		
O'CONNOR, Joseph D.	GS-9		Q-WA-40486/MS	2.63	NRDL	15 Apr	1 Jul
O'GORMAN, Thomas V.			Secret	2.62	SIO	Mar	
O'GRADY, Harry J.				2.62	SIO		
OLDEN, Michael J.	GS-7		Q-NY-20686	2.64	AEC	27 May	
OLSEN, Charles				2.2	ESL		
O'NEILL, Stanley W.			Secret	2.62	SIO	Mar	
OWEN, Wallace L.	GS-9		Q-WA-13415	2.9	BuShips	1 Apr	
PAQUETTE, Robert G.			Secret	2.62	SIO	Mar	
PATTERSON, George R.	GS-12 equiv		Q-87192	2.10	NRDL	18 Jun	26 Jul
PEARSON, Harry H.			Secret	2.62	SIO	Mar	
PEFFLEY, Willard M.*	SV3, USN	458 15 61	M/Secret	2.61	NRDL	12 Mar	25 Jun
PELOSI, Edward A. (alter)	GS-8 equiv		M/Secret	2.63	NRDL		
PERKINS, Walter W.	GS-11		Q-WA-18640	2.63	NRDL	24 Mar	1 Jul
PETERSON, Gerald A.	Pvt, USA	US55536833	Secret	2.51	ACC	8 Apr	
PHILLIPS, Earl L.	GS-12		M/Secret	2.10	NRDL	9 Apr	25 Jun
PICCONE, Richard L.	HM3, USN	373 75 94		2.10	NRDL	9 Apr	26 Jul
PIDSON, Ernest A.*	Col, USAF	3117A	Q-WA-2181/TS	2.66	AFSWC	10 Apr	
PITTINGER, Abraham L.(alt)	Contractor		M/Secret	2.61	NRDL	25 Mar	25 Jun
PLENY, Evan R.	GS-12 equiv		Q-86660	2.10	NRDL	9 Apr	25 Jun
PRITCHARD, Donald W.			Secret	2.62	SIO	Mar	
PROULX, Edmond J.			Secret	2.62	SIO	Mar	
PULLIAM, James M.	M/SGT,USAF	6911531	T/S	2.66	AFSWC	10 Apr	
PURDY, Kenneth E.	HM2, USN	388 91 59		2.10	NRDL	9 Apr	26 Jul
PUTZKER, Albin A.			Secret	2.62	SIO	Mar	
PAOLILLO, Thomas G.	GS-11 equiv		M/Secret	2.10	NRDL	9 Apr	25 Jun

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, First, Initial	Grade or Rank	Service Number	Security Clearance	Project	Agency	Arrival Date	Departure Date
RAST, Richard G.*	GS-11		Q-WA77193/S	2.1	ESL	18 Mar	
REVELLE Roger R.			Q-25707SWI/S	2.62	SIO	Mar	
REXROAD, Ralph E.	GS-11		Q-WA71147/TS	2.65	ACC	13 May	
RHOADS, Forrest A.	GS-9		Q-NA-602/MS	2.63	NRDL	24 Mar	1 Jul
RICE, Clyde J.			Secret	2.62	SIO	Mar	
RIGOTTI, David L.	GS-12		Secret	2.51	ACC	1 Apr	
RINEHART, Forrest B.	CWO, USN	556004	M/Secret	2.63	NRDL	24 Mar	1 Jul
RINNERT, Heinz R.	GS-11		Q-WA-21339/MS	2.7	NRDL	3 Apr	1 Aug
ROBERTS, Donald R.	SP3, USA	US55488413	Secret	2.65	ACC	18 Mar	
ROGERS, William W.*			Q-SA-11076	2.52	SC	19 Apr	
ROHS, Robert R.	PVT, USA	US51346633	Secret	2.51	ACC	8 Apr	
ROWELL, Monte H.	GS-9		Q-WA-21340/S	2.63	NRDL	15 Apr	1 Jul
SANDERS, Joe D.	GS-11			2.10	NRDL	18 Jun	26 Jul
SARTOR, James D.	GS-11		Q-WA21341/MS	2.10	NRDL	28 Apr	28 May
SCHAUS, William P. Sr	M/SGT,USAF	AF6913489	T/S	2.66	AFSWC	10 Apr	
SCHMOKE, Murray A.*	GS-9		Q-WA-93588/S	2.4	ACC	8 Apr	
SCHOENIG, Charles A.	GS-5		Q-NY-21715	2.64	AEC	12 Apr	
SCHUERT, Edward A.	GS-12		Q-WA-19116	2.63	NRDL	15 Apr	1 Jul
SCHUMCHYK, Michael J.	GS-11		Q-WA22427/TS	2.65	ACC	30 Mar	
SCHWARTZ, Albert (NMI)*	GS-7		Q-WA77197/S	2.2	ESL	18 Mar	
SCHWARTZLOSE, Richard A.*			Secret	2.62	SIO	Mar	
SENT, Harris C.	HM2, USN	462 35 69		2.10	NRDL	9 Apr	26 Jul
SHAW, Harold E.	Capt	058600	T/S	2.65	ACC	12 Apr	
SHELBERG, Wesley E.	GS-13		Q-68566/MS	2.63	NRDL	1 Apr	1 Jul
SHIRASAWA, Takeo H.*	GS-11		Q-WA-18655/MS	2.63	NRDL	25 Mar	25 Jun
SHORT, George R.				2.62	SIO		
SILVERMAN, Maxwell (NMI)			Secret	2.62	SIO	Mar	
SIVLEY, Theodore E.	GS-8 equiv		Q-WA-27009/MS	2.63	NRDL	1 Apr	1 Jul
SMELSER, Clifford E.			Secret	2.62	SIO	Mar	

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
SMITH, Alan C.*			Secret	2.62	SIO	Mar	
SMITH, Albert L.	GS-12		Q-45221/MS	2.10	NRDL	6 Jul	26 Jul
SMITH, Robert J.*	GS-9		Q-NA-43775/S	2.4	ACC	8 Apr	
SMITH, Warren A.	ET3, USN	454 15 06	M/Secret	2.63	NRDL	1 Apr	1 Jul
SOLTIS, Frederick S.	Contractor		M/Secret	2.61	NRDL	25 Mar	25 Jun
SOMMERS, Kenneth G.	GS-5		Q-NY-27157	2.64	ACC		
SOULE, Richard R.*	GS-12		Q-NA-1662/MS	2.61	NRDL	25 Mar	25 Jun
SOUSA, Louis M.	GS-9		M/Secret	2.10	NRDL	17 May	26 Jul
SPENCER, Samuel C.	HM2, USN	229 77 63		2.10	NRDL	9 Apr	26 Jul
STEELE, Arthur J.*	Capt, USAF	16806A	Q-WA-23752/TS	2.66	AFSWC	10 Apr	
STOLAN, Howard N.	HM1, USN	565 15 41	M/Secret	2.10	NRDL	9 Apr	26 Jul
STOUT, Charles A.	Pvt, USA	US5415951?	Secret	2.51	ACC	1 Apr	
STOVER, John H., Jr.	CDR, USN	123267	T/S	2.8	NRDL	1 May	2 Jun
SULET, Robert A.	GS-11		Q-WA-93934/MS	2.10	NRDL	9 Apr	21 May
SULLIVAN, Robert M.	Pfc, USA	US5133997?	Secret	2.65	ACC	13 Mar	
TANNER, David S.	LTJG, USN		Q-WA-83359	2.63	NRDL	24 Mar	1 Jul
TARBOX, James L.	WB-17		Secret	2.65	ACC	20 Mar	
TARRAS, Seymore (NMI)	GS-5		Q-NY-27537	2.64	ACC	24 Jun	
TARVER, Lincoln S.(alter)		967-06394		2.63	NRDL		
TREASE, Gene M.			Secret	2.62	SIO	Mar	
TRIFFET, Terry (NMI)	GS-13		M/TS	2.63	NRDL	1 Apr	1 Jul
TOMPKINS, Edward R.	GS-15		Q-NA-38267/MTS	2.63	NRDL	1 May	5 Jun
TOMPKINS, Robert C.	GS-12		Q-NA-20257/TS	2.65	ACC	30 Mar	
TOLOSKO, Michael S.(Alter	GS-3 equiv		M/Secret	2.63	NRDL		
TSIVITSE, Peter J., Jr.	Pvt, USA	US5133804?	Secret	2.51	ACC	18 Mar	
TUSTIN, Richard P.	GS-9		Q-NA-52947/TS	2.2	ESL	21 Apr	
UMSCHEID, Darrell Q.*	CD2, USN	319 22 31	M/Secret	2.61	NRDL	12 Mar	25 Jun
VANDIVERT, Verl V.	GS-12		Q-NA-9283/MS	2.63	NRDL	15 May	1 Jul
VAN GORDEN, Harry J.*	GS-9		Secret	2.1	ESL	10 Apr	
VAN LINT, Victor A.J.	Pvt, USA	US51351879	I/TS	Prog 2	TU 3	13 Mar	

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, First, Initial	Grade or Rank	Service Number	Security Clearance	Project	Agency	Arrival Date	Departure Date
VANN, Archie T.			Secret	2.62	SIO	Mar	
VEAL, William T.	SWCN, USN	499 85 69	M/Secret	2.63	NRDL	24 Mar	1 Jul
VELIA, Noah J.	GS-7		Q-WA-12545	2.8	NRDL	15 Apr	2 Jun
VENTURA, Angel H. (alter)	GS-9		Q-WA-125467/TS	2.63	NRDL		
VERBISCAR, Anthony J.	PVT-2, USA	US55521954	Secret	2.65	ACC	30 Mar	
VINE, Frank S.	GS-12		Q-WA28367/S	2.9	BUSHIPS	1 Apr	
VOSS, Richard W. (alter)	GS-11 equiv		Q-WA22926/TS	2.63	NRDL		
WAGNER, Joseph (NMI)(alter)	GS-11		Q-WA-15635/TS	2.63	NRDL		
WALLACE, W.	YN1, USN	381 27 44	T/S	Prog 2	TU-3	18 Mar	
WALSH, John J. Jr.	PVT, USA	US51354440	Secret	2.65	ACC	18 Mar	
WATWICK, Sidney Y.	GS-9		Q-NY-19572	2.64	AEC	10 Apr	
WERNER, Louis B.	GS-14		Q-89777/MTS	2.63	NRDL	15 Apr	30 May
WESP, Raymond J.	ET3, USN	553 49 89	M/Secret	2.63	NRDL	1 Apr	1 Jul
WESTOVER, Lemoyne B.	PFC, USA	US52376?4	Secret	2.65	ACC	20 Mar	
WHITNEY, Ira N.	GS-13		Q-93437-NY	2.64	AEC	7 May	
WILLIAMSON, Stanley "R"	GS-12		MT/S	2.10	NRDL	2 Apr	12 Jul
WILLIAMSON Willie L.	SW2, USN	440 86 13	M/Secret	2.63	NRDL	24 Mar	1 Jul
WILMOTH, Arthur L.	GS-9 equiv		M/Secret	2.7	NRDL	8 Apr	15 Jul
WILSEY, Edward F.	GS-11		Q-WA22428/TS	2.65	ACC	18 Mar	
WILSON, Frederick C.	GS-7		Q-NY-22453	2.64	AEC	1 Apr	
WILSON, Joseph O.	CMG1, USN	617 16 74		2.63	NRDL	24 Mar	1 Jul
WILSON, Robert C.	GS-9		M/Secret	2.10	NRDL	18 Jun	26 Jul
WISNER, Robert L.			Secret	2.62	SIO	Mar	
WOLF, Theodore (NMI)	ET1, USN	314 74 71		2.63	NRDL	1 Apr	1 Jul
WONG, Kai Ming	GS-9 equiv		Secret	2.7	SFNS	8 Apr	15 Jul
WOOD, Henry A. III	PVT, USA	US57327281	Secret	2.51	ACC	1 Apr	
WORRALL, Charles G.			Secret	2.62	SIO	Mar	
YOLI, Alfred H.	GS-10		Q-NY-11283	2.64	AEC	10 Jun	
YONENAKA, Hideo H.	PVT, USA	US56259824	Secret	2.65	ACC	30 Mar	

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ALPHABETICAL LIST OF PROGRAM 2 PROJECT PERSONNEL (Cont'd)

Name Last, first, initial	Rank or Grade	Service No.	Security Clearance	Project	Agency	Arrival Date	Departure Date
YOUNG, Manley L.W.				2.62	SIO	Mar	
ZAGORITES, Harry A.	GS-11		Q-NA-75630/MS	2.7	NRDL	24 Apr	1 Jun
ZIGMAN, Paul E.	GS-13		Q-NA-236/MTS	2.63	NRDL	1 Apr	30 May
ZILIS, Charles J.			Secret	2.62	SIO	Mar	
ZIMNEY, Charles M.	Contractor		M/Secret	2.61	NRDL	25 Mar	25 Jun
ZWICKER, Leon P.	GS-9		M/Secret	2.10	NRDL	18 Jun	26 Jul

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SECTION VII - B

PROJ. 2.1 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Crotchfelt, Joseph H.	WB-20						
Hurley, Thomas J. Jr.*	GS-9						
Johnson, Ockle E. Jr.*	Pfc,USA						
Larrick, Ross G.*	GS-11						
Markow, Basil (NMI)	GS-12						
Marmiroli, Robert G.*	GS-9						
McLaughlin, William L.	Pfc, USA						
Rast, Richard G.*	GS-11						
Van Gorden, Harry J.*	GS--9						

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SECTION VII - B

PROJECT 2.2 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt.	Date
Brown, Peter (NMI)*	GS-14	ELMER					
Cantor, Gilbert (NMI)		"					
Caruba, Walter E.	GS-8	"					
Ellstrom, Eric C.*	GS-11	"					
Gallas, William (NMI)	WB-20	"					
Giacalone, Joseph G.	WB-15	"					
Nigro, Nicholas S.	GS-9	"					
Olsen, Charles (NMI)		"					
Schwartz, Albert (NMI)*	GS-7	"					
Tustin, Richard P.	GS-9	"					

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PROJ. 2.4 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg.	Billet No.	Phone	Exposure Record	
						Amt.	Date
Dhein, Ernest H.	GS-13	ELMER					
Forsyth, Northern H.	Pvt.2,USA	ELMER					
Funston, Herbert O.	2/Lt, USA	ELMER					
Maloney, Joseph C.	GS-11	ELMER					
Schmoke, Murray A.*	GS-9	ELMER					
Smith, Robert J.*	GS-9	ELMER					

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SECTION VII - B

PROJ. 2.51 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Abbot, Richard D	Pvt						
Barnett, Benjamin (NMI)*	GS-14						
Bouton, Edwin H.	GS-13						
Brace, Charles L.	Pfc, USA						
Engquist, Elmer H.*	GS-14						
Francis, Arthur B.*	Pfc, USA						
Frese, Gildo V.	Pvt, USA						
Harwit, Martin O.	Pvt, USA						
Kinch, John W.	GS-9						
Kinsel, Tracy S.	Pvt, USA						
Lindwarm, Joseph (NMI)*	GS-14						
Luke, Charles W.	Capt, USA						
Peterson, Gerald A.	Pvt, USA						
Rigotti, David L.	GS-12						
Rohs, Robert R.	Pvt, USA						
Stout, Charles A.	Pvt, USA						
Tsivitse, Peter J., Jr.	Pvt, USA						
Wood, Henry A, III	Pvt, USA						

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SECTION VII - B

PROJ. 2.52 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Cowan, Maynard	Civ						
Laney, Thomas F.	Civ						
List, Dean B.*	Civ						
Looney, Trevor C.	Civ						
Rogers, William W.*	Civ						

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PROJ 2.61 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Ball, Laverl N.*	CMCN, USN						
Brown, Frank E.*	SV3, USN						
Carpenter, Wilbur D.*	BU3, USN						
Carter, Lyle A.	GS-12						
Dashney, Gary A.*	SV3, USN						
Eklund, Melvin H.	EM3, USN						
Fite, Donald W.	Contractor						
Fitzgerald, Thomas T.*	CE3, USN						
Grote, Norrell H.*	BUL1, USN						
Herman, John J.*	CE3, USN						
Hubbard, Edgar Q.*	SVC, USN						
McLaughlin, Austin G.	Contractor						
Moffat, Robert J.*	CE3, USN						
Peffley, Willard M.*	SV3, USN						
Pittinger, Abraham L.	Contractor						
Shirasawa, Takeo H.*	GS-11						
Soltis, Frederick S.	Contractor						
Soule, Richard R.	GS-12						
Umscheid, Darrell Q.*	CD2, USN						
Zimney, Charles M.	Contractor						

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PROJ. 2.62 PERSONNEL

Name Last, First, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Ames, Michael R.*	Civ						
Ames, Oscar (NMI)	Civ						
Barton, Frank C.	Civ						
Bratz, Arthur E.N.	Civ						
Brennen, Robert E.	Civ						
Brown, Daniel M.	Civ						
Bussman, Floyd C.	Civ						
Chandler, Julian A.C.,II	Civ						
Chapman, John E.	Civ						
Clampitt, Clanton W., Jr.	Civ						
Clark, Geoffrey C.	Civ						
Conger, Kenneth R.	Civ						
Costello, James P. Jr.	Civ						
Dalgren, Herbert(NMI)	Civ						
Dennager, Edward J.	Civ						
Eddy, Terrel R.	Civ						
Falkner, Garth E.	Civ						
French, John M.	Civ						
Fleming, Charles S.*	Civ						
Folsom, Theodore R.*	Civ						
Gilkey, Robert W.	Civ						
Hanson, Terry (NMI)	Civ						
Hopkins, Marvin F.	Civ						
Horrer, Paul L.*	Civ						
Huffer, Robert P.*	Civ						
Isaacs, John D., III*	Civ						
Jennings, Cecil D.	Civ						
Jennings, Feenan D.*	Civ						
Livingston, Carlton S.	Civ						
Lucas, Jack C.	Civ						

(Continued)

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SECTION VII - B

PROJ. 2.62 PERSONNEL (Cont'd)

Name Last, First, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Martin, DeCourcey (NMI)	Civ						
Mather, James A.	Civ						
McLaughlin, Junior H.	Civ						
Moulton, Arthur B.	Civ						
O'Gorman, Thomas V.	Civ						
O'Grady, Harry J.	Civ						
O'Neill, Stanley W.	Civ						
Paquette, Robert G.	Civ						
Pearson, Harry H.	Civ						
Pritchard, Donald W.	Civ						
Proulx, Edmond J.	Civ						
Putzker, Albin A.	Civ						
Revelle, Roger R.	Civ						
Rice, Clyde J.	Civ						
Schwartzlose, Richard A.*	Civ						
Short, George R.	Civ						
Silverman, Maxwell (NMI)	Civ						
Smelser, Clifford E.	Civ						
Smith, Alan C.*	Civ						
Trease, Gene M.	Civ						
Vann, Archie T.	Civ						
Wisner, Robert L.	Civ						
Worrall, Charles G.	Civ						
YOUNG, Manley L.W.	Civ						
Zilis, Charles J.	Civ						

SECTION VII - B

PROJ. 2.63 PERSONNEL

Name Last, First, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Adams, Charles E.	GS-12						
Alvarez, Ernest L.							
Baum, Sanford (NMI)	GS-11						
Beckman, Arthur R.	GS-8 Equiv						
Bell, Melvin A.	SW1, USN						
Berto, Andrew L. (alternate)	GS-8 Equiv						
Blondo, Clemence J. (alternate)							
Boetel, Emil E.							
Chan, Harry K.	GS-9						
Chow, Benjamin (NMI)	GS-11						
Cooper, Eugene P.	GS-15						
Cook, Theophile J.	SN, USN						
Covell, David F.	GS-12						
Covey, Elwin H.	GS-11						
Dugas, Davis R.	BM2, USN						
Duma, Ira N.	SN, USN						
Ebel, Melvin L.	GS-9 equiv						
Egeberg, Lansing E.	GS-11						
Evans, Evan C., III	GS-12						
Evans, Frank L. (alternate)	GS-8						
Farlow, Neil H.	GS-11						
Foti, Stephen C.	GS-9						
French, Fredrick A.	GS-11						
Fugate, Bedford L.	SN, USN						
Fuller, Wilson F.	ET1, USN						
Hampton, William L.	SWCA, USN						
Hooley, Francis E.	ET3, USN						
Hunter, Homer A.	SWCN, USN						
Johnson, Richard L.	ETSM, USN						

(Continued)

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SECTION VII - B

PROJ. 2.63 PERSONNEL (Cont'd)

Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Kaste, Ray R.	ET3, USN						
LaRiviere, Philip D.	GS-12						
Lacost, John K.	ET3, USN						
Lara, Martin J. (alternate)	GS-4						
Lipanovich, Marko J.	GS-12						
Macdonald, Douglas (NMI) (alternate)	GS-11						
Mackin, James L. (alternate)	GS-11						
Marshall Neil A. (alternate)	GS-14						
Miller, Lewis D.	GS-9						
Morris, William A.	CD2, USN						
Morrison, William L., Jr.	GS-9						
Moyer, Charles B. (alternate)	GS-10						
Neil, Kenneth J.	CE3, USN						
Nuckolls, Melvin J.	GS-7						
O'Connor, Joseph D.	GS-9						
Pelosi, Edward A. (alternate)	GS-8 Equiv						
Perkins, Walter W.	GS-11						
Rhoads, Forrest A.	GS-9						
Rinehart, Forrest B.	CWO, USN						
Rowell, Monte H.	GS-9						
Schuert, Edward A.	GS-12						
Shelberg, Wesley E.	GS-13						
Sivley, Theodore E.	GS-8 Equiv						
Smith, Warren A.	ET3, USN						
Tanner, David S.	LTJG, USN						
Tarver, Lincoln S. (alternate)							
Tolosko, Michael S.	GS-8 Equiv						
Tompkins, Edward R.	GS-15						
Triffet, Terry (NMI)	GS-13						
Vandivert, Verl V.	GS-12						

(Continued)

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SECTION VII - B

PROJ. 2.63 PERSONNEL (Cont'd)

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Veal, William T.	SWCN, USN						
Ventura. Angel H. (alternate)	GS-9						
Voss, Richard W. (alternate)	GS-11 Equiv						
Wagner, Joseph (NMI) (alternate)	GS-11						
Werner, Louis B.	GS-14						
Wesp, Raymond J.	ET3, USN						
Williamson, Willie L.	SW2, USN						
Wilson, Joseph O.	CMG1, USN						
Wolf, Theodore (NMI)	ET1, USN						
Zigman, Paul E.	GS-13						

SECTION VII - B

PROJ. 2.64 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt.	Date
Cassidy, Melvin E.	GS-11						
French, Edwin R.	GS-5						
Glauberman, Harrold (NMI)	GS-9						
Graveson, Robert T.	GS-13						
Hamada, Gerald H.	GS-5						
Harley, John (NMI)	GS-15						
Haskell, Irwin (NMI)	GS-7						
Klevin, Paul B.	GS-13						
LeVine, Harris D.	GS-15						
O'Brien, Keran P.	GS-9						
Olden, Michael J.	GS-7						
Schoenig, Charles A.	GS-5						
Sommers, Kenneth G.	GS-5						
Tarras, Seymore (NMI)	GS-5						
Watnick, Sidney Y.	GS-9						
Whitney, Ira N.	GS-13						
Wilson, Frederick C.	GS-7						
Yoli, Alfred H.	GS-10						

SECTION VII - B

PROJ. 2.65 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Berman, Arnold (NMI)	Sp3, USA						
Comeford, Arnold (NMI)	Pfc, USA						
Conine, Robert D.*	Pfc, USA						
Crisco, Carl (NMI), Jr.*	Pfc, USA						
Gordon, Malcolm G.	GS-12						
Hall, William F., Jr.	GS-9						
Hardin, Luther M.*	GS-12						
Hewitt, Charles A.	Sp3, USA						
Hutchinson, John G.	Pfc, USA						
Johnson, John P.*	Pfc, USA						
Knowles, Frederick L.	Pfc, USA						
Krey, Philip W.*	GS-12						
Langenhagen, Charles F.	Pvt, USA						
Lapic, John R.	Pfc, USA						
McCarty, Philip F.*	Sp3, USA						
McIsaac, Joseph P.	Sp2, USA						
McNeilly, John H.*	2ndLT, USA						
Millsap, Dean A.	Sp2, USA						
Mock, George B.	Pfc, USA						
Morgenthau, Manfred (NMI)	GS-13						
Rexroad, Ralph E.	GS-11						
Roberts, Donald R.	Sp3, USA						
Schumchyk, Michael J.	GS-11						
Shaw, Harold E.	Capt, USA						
Sullivan, Robert M.	Pfc, USA						
Tarbox, James L.	WB-17						
Tompkins, Robert C.	GS-12						
Verbiscar, Anthony J.	Pvt, USA						
Walsh, John J., Jr.	Pvt, USA						
Westover, Lemoyne B.	Pfc, USA						
Wilsey, Edward F.	GS-11						
Yonenaka, Hideo H.	Pvt, USA						

SECTION VII - B

PROJ. 2.66 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Banks, James E.	1stLt, USAF						
Crumley, Paul M.*	Capt, USAF						
Dick, James L.*	Capt, USAF						
Endsley, David L.	2ndLt, USAF						
Harlow, Marvin V., Jr.	2ndLt, USAF						
Hord, John d'H.	Maj, USAF						
Kaericher, Kermit C.*	Capt, USAF						
Merian, Richard F.	Capt, USAF						
Pinson, Ernest A.*	Col, USAF						
Pulliam James M.	M/SGT, USAF						
Schaus, William P., Sr.	M/SGT, USAF						
Steele, Arthur James*	Capt, USAF						

SECTION VII - B

PROJ. 2.7 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Blatner, Robert E.	GS-9 equiv						
Campbell, Charles E.	GS-11 equiv						
Curry, Albert M., Jr. (alternate)	GS-9 equiv						
Eason, John R.	GS-9 equiv						
Faber, Fred E. (alternate)	GS-9 equiv						
French, Orrin A.	GS-9 equiv						
Holmlund, Gordon W.	GS-9 equiv						
Louie, Henry (NMI)	GS-11						
Morris, William L. (alternate)	GS-9 equiv						
Rinnert, Heinz R.	GS-11						
Wilmoth, Arthur L.	GS-9 equiv						
Wong, Kai Ming	GS-9 equiv						
Zagorites, Harry A.	GS-11						

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SECTION VII - B

PROJ 2.8 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Black, Robert H.	GS-9						
Crew, Robert J.	GS-11						
Fuller, Ross K.	GS-9						
Guay, Albert J.	GS-7						
Gustafson, Donald J.	GS-7 equiv						
Heiskell, Raymond "H"	GS-12						
Kawahara, Francis K.	GS-9						
Lane, William B.	GS-12						
Lee, Hong (NMI)	GS-11						
Leen, Robert A.	GS-7						
Stover, John H., Jr.	CDR, USN						
Vella, Noah J.	GS-7						

SECTION VII - B

PROJ. 2.9 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Owen, Wallace L.	GS-9						
Vine, Frank S.	GS-12						

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SECTION VII - B

PROJ. 2.10 PERSONNEL

Name Last, first, initials	Rank or Grade	Island Location	Bldg No.	Billet No.	Phone	Exposure Record	
						Amt	Date
Armstrong, Woodrow J.	GS-14						
Backman, George E.	GS-12 equiv						
Bigger, Michael M.	GS-13						
Brown, Glen D.	GS-12 equiv						
Cherowrier, Edward (NMI)	GS-9						
Curtis, Harold B.	ENS, USNR						
Dale, Allen R.	GS-9						
Devlin, Frank A.	GS-9						
Ernst, Lloyd E.	HM1, USN						
Fletcher, Irvin D.	HM3, USN						
Hammond, Charles E.	GS-9 equiv						
Hawkins, Myron B.	GS-14						
Heron, Donald J.	GS-11						
Irwin, Carl K.	Gs-12 equiv						
Kearns, James J.	GS-14						
Law, Joseph E., Jr.	GS-11						
Leahy, Edward J.	GS-9						
Lindberg, Bobby G.	GS-12 equiv						
Majeski, Felix J.	GS-12						
Molumphy, George G.	CAPT, USN						
Paolillo, Thomas G.	GS-11						
Patterson, George R.	GS-12 equiv						
Phillips, Earl L.	GS-12						
Piccone, Richard L.	HM3, USN						
Pleny, Evan B.	GS-12 equiv						
Purdy, Kenneth E.	HM2, USN						
Sanders, Joe D.	GS-11						
Sartor, James D.	GS-11						
Sent, Harris C.	HM2. USN						

(Continued)

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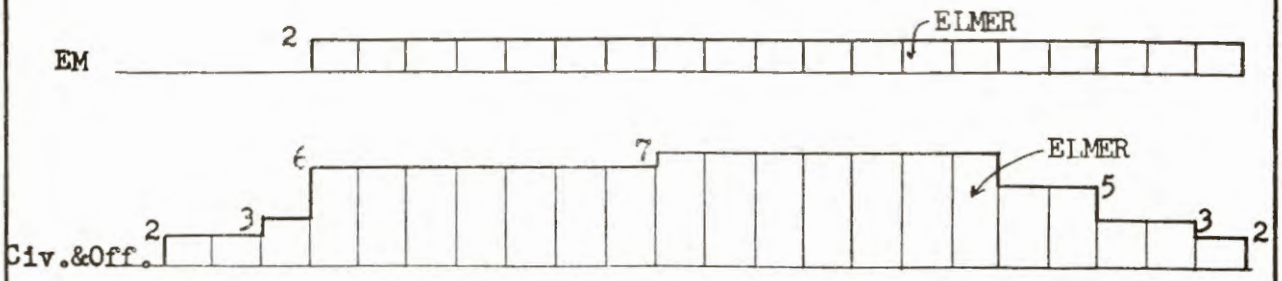
SECTION VII - B

PROJ. 2.10 PERSONNEL (Cont'd)

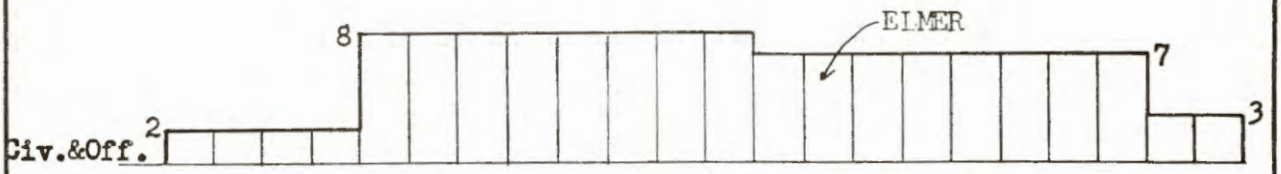
Name Last, first, initials	Rank or Grade	Island Location	Bldg. No.	Billet No.	Phone	Exposure Record	
						Amt.	Date
Smith, Albert L.	GS-12						
Sousa, Louis M.	GS-9						
Spencer, Samuel C.	HM2, USN						
Stolan, Howard N.	HM1, USN						
Sulet, Robert A.	GS-11						
Williamson, Stanley "R"	GS-12						
Wilson, Robert C.	GS-9						
Zwicker, Leon P.	GS-9						

SECTION VII - C

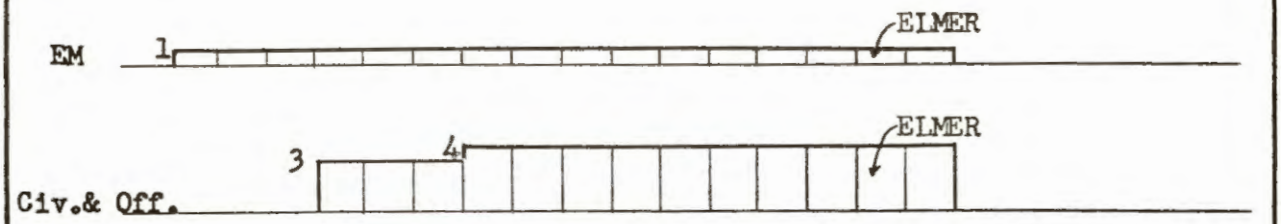
PERSONNEL TIME PHASING TO TEST SITE



Project 2.1



Project 2.2



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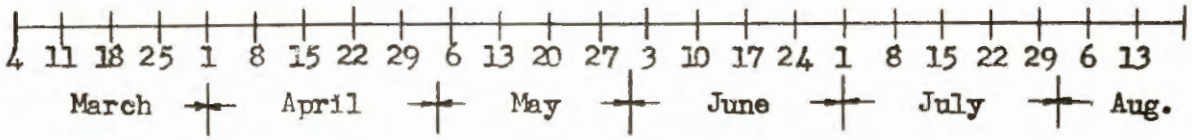
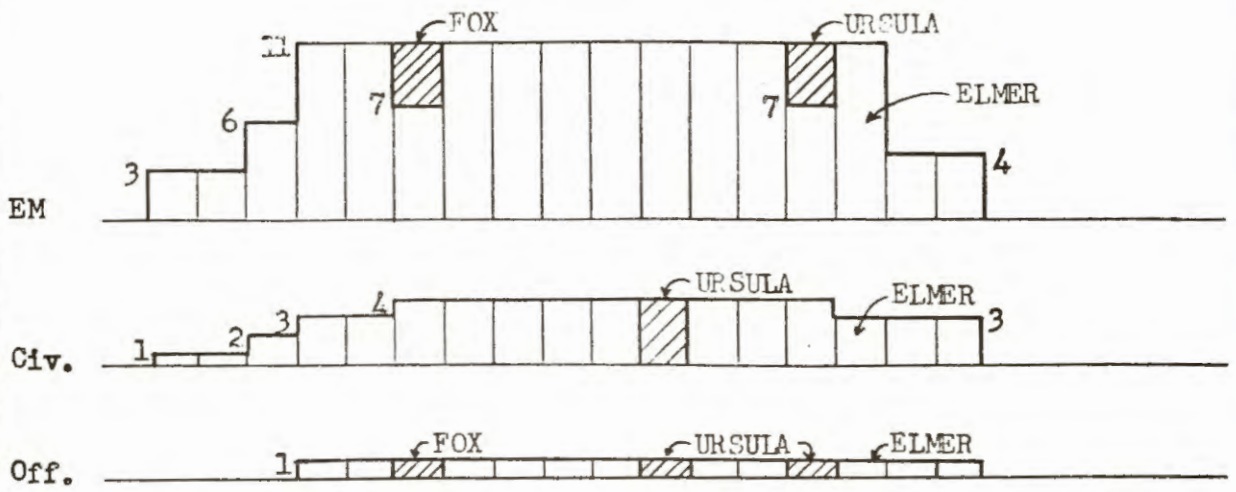
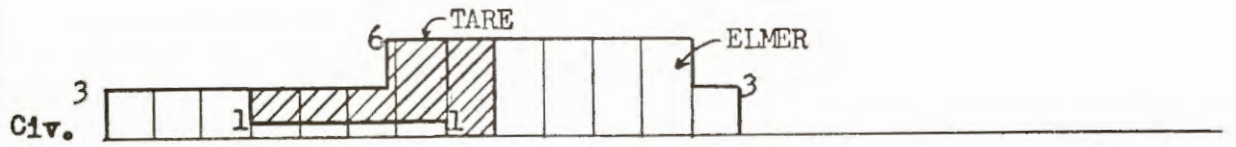


SECTION VII - C

PERSONNEL TIME PHASING TO TEST SITE (Cont)



Project 2.51



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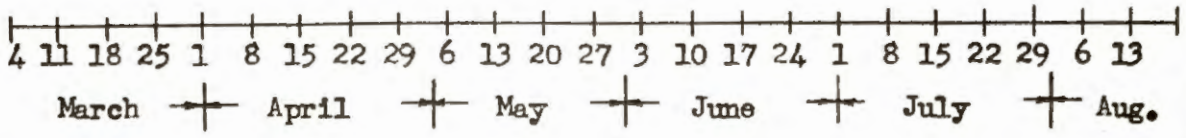
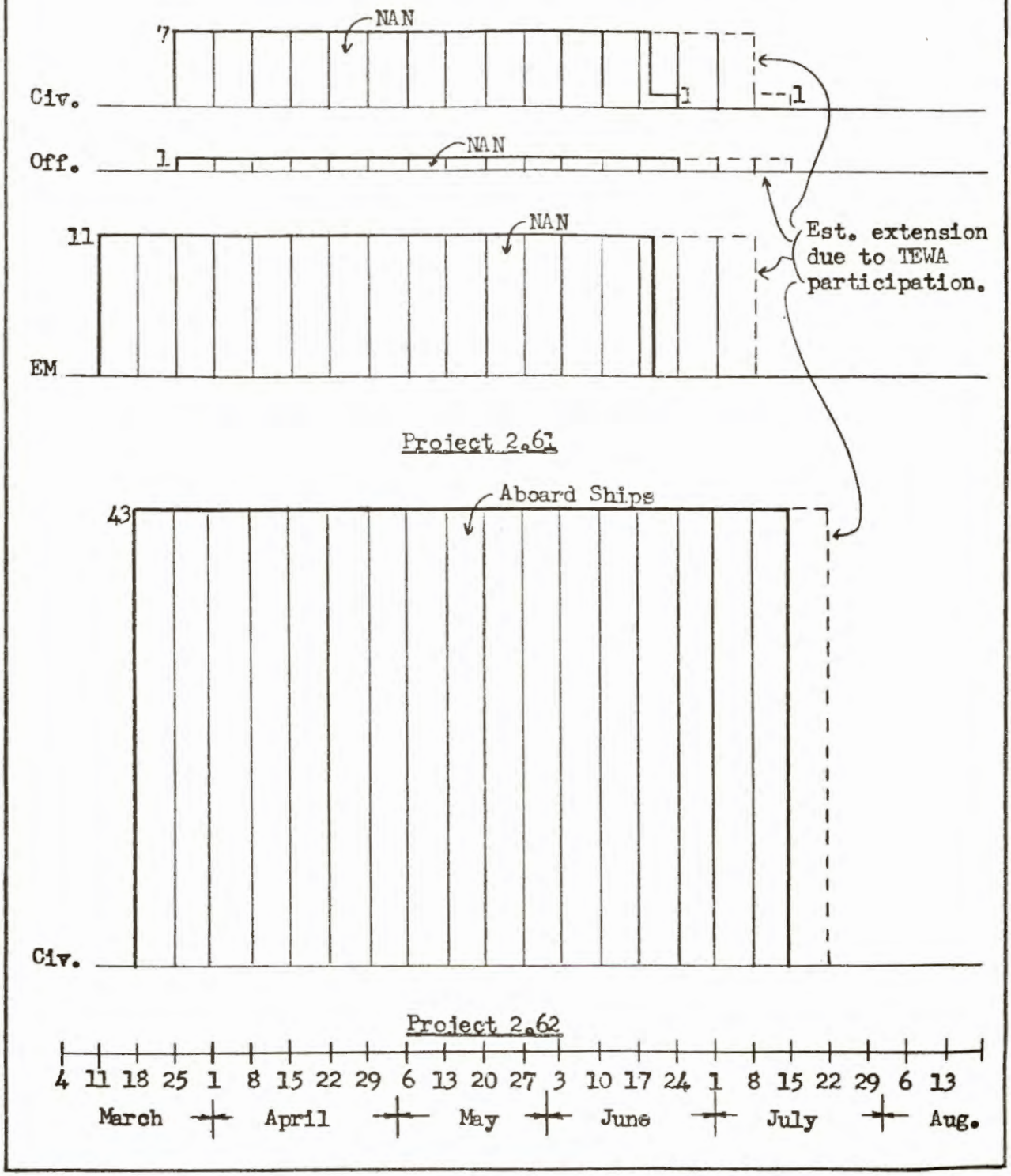


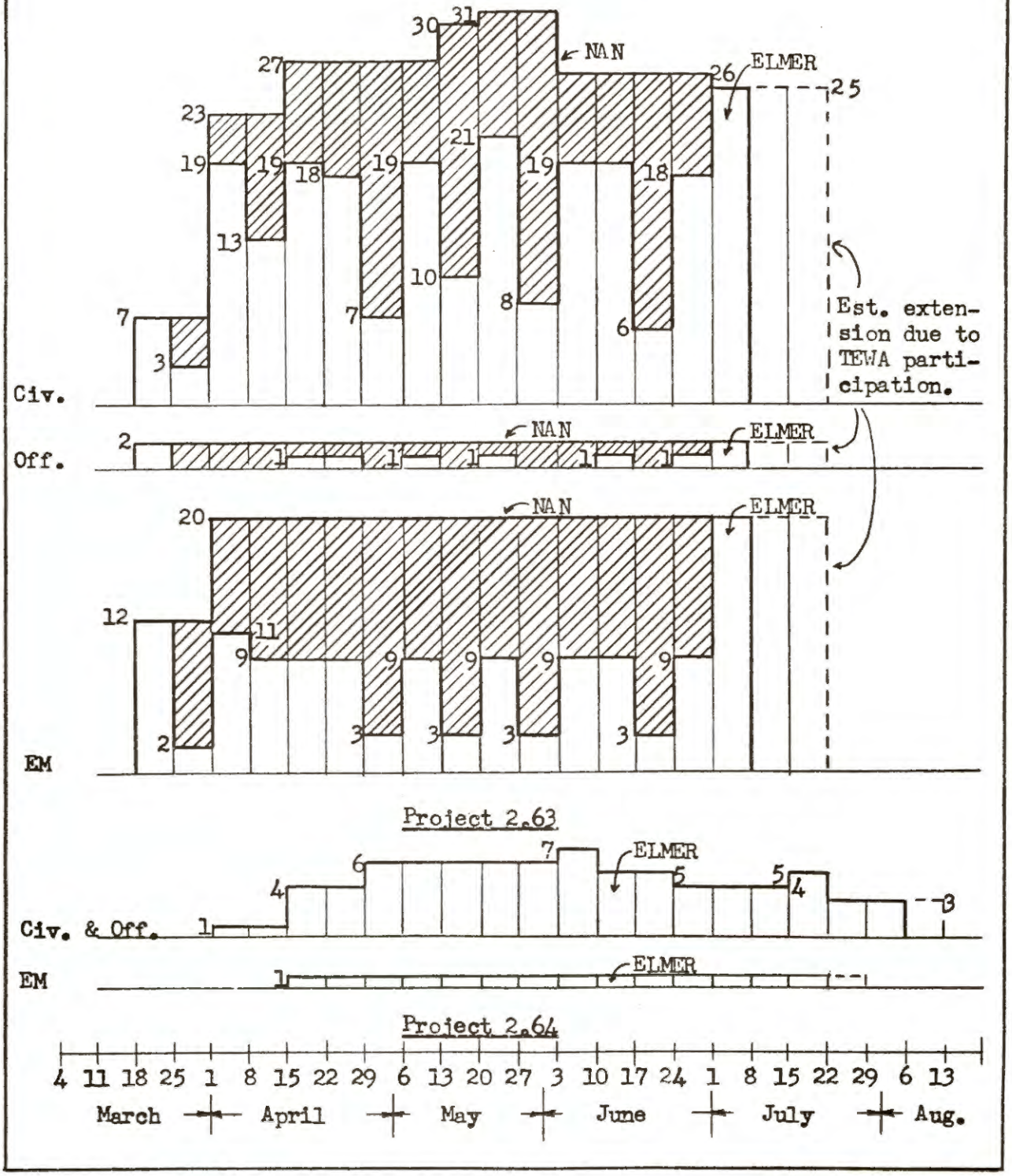
SECTION VII - C

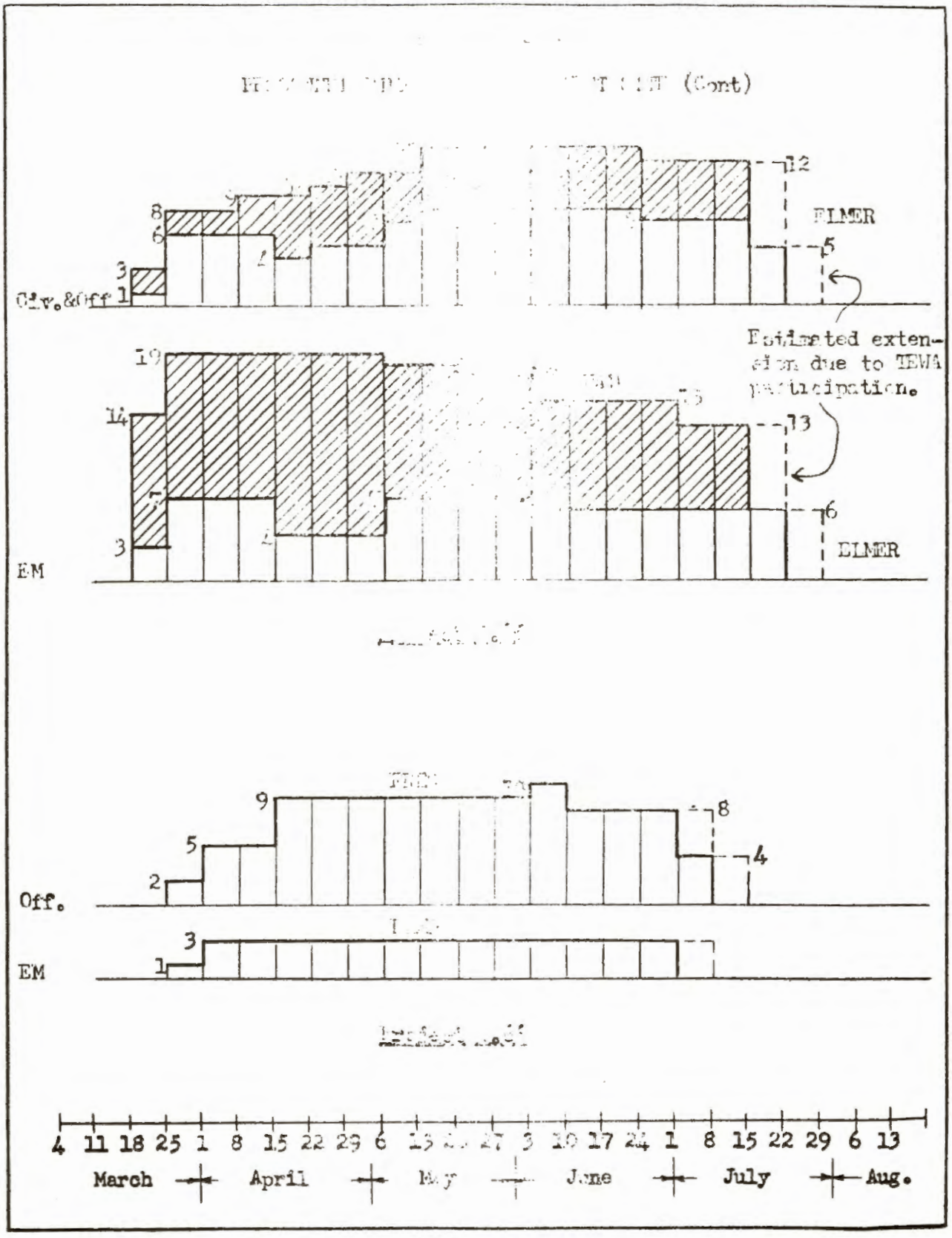
PERSONNEL TIME PHASING TO TEST SITE (Cont.)



SECTION VII - C

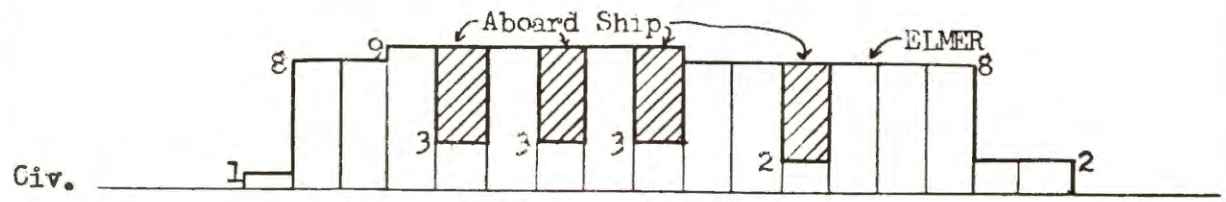
PERSONNEL TIME PHASING TO TEST SITE (Cont.)



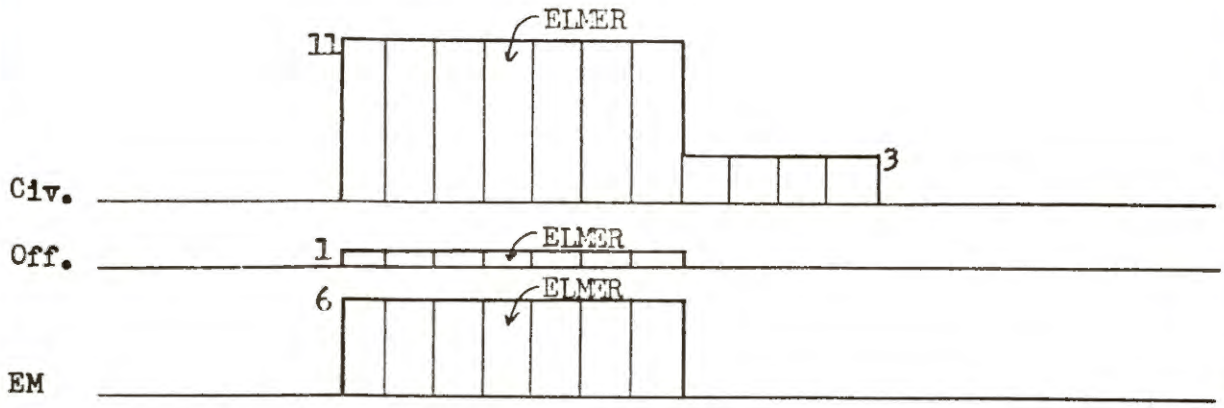


SECTION VII - C

PERSONNEL TIME PHASING TO TEST SITE (Cont.)

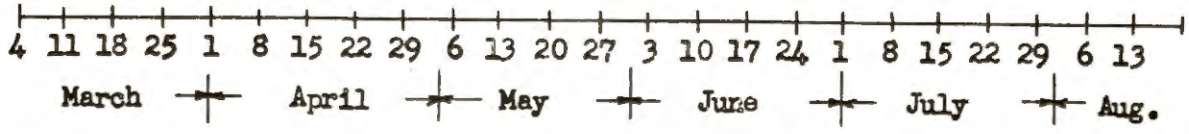


Project 2.7



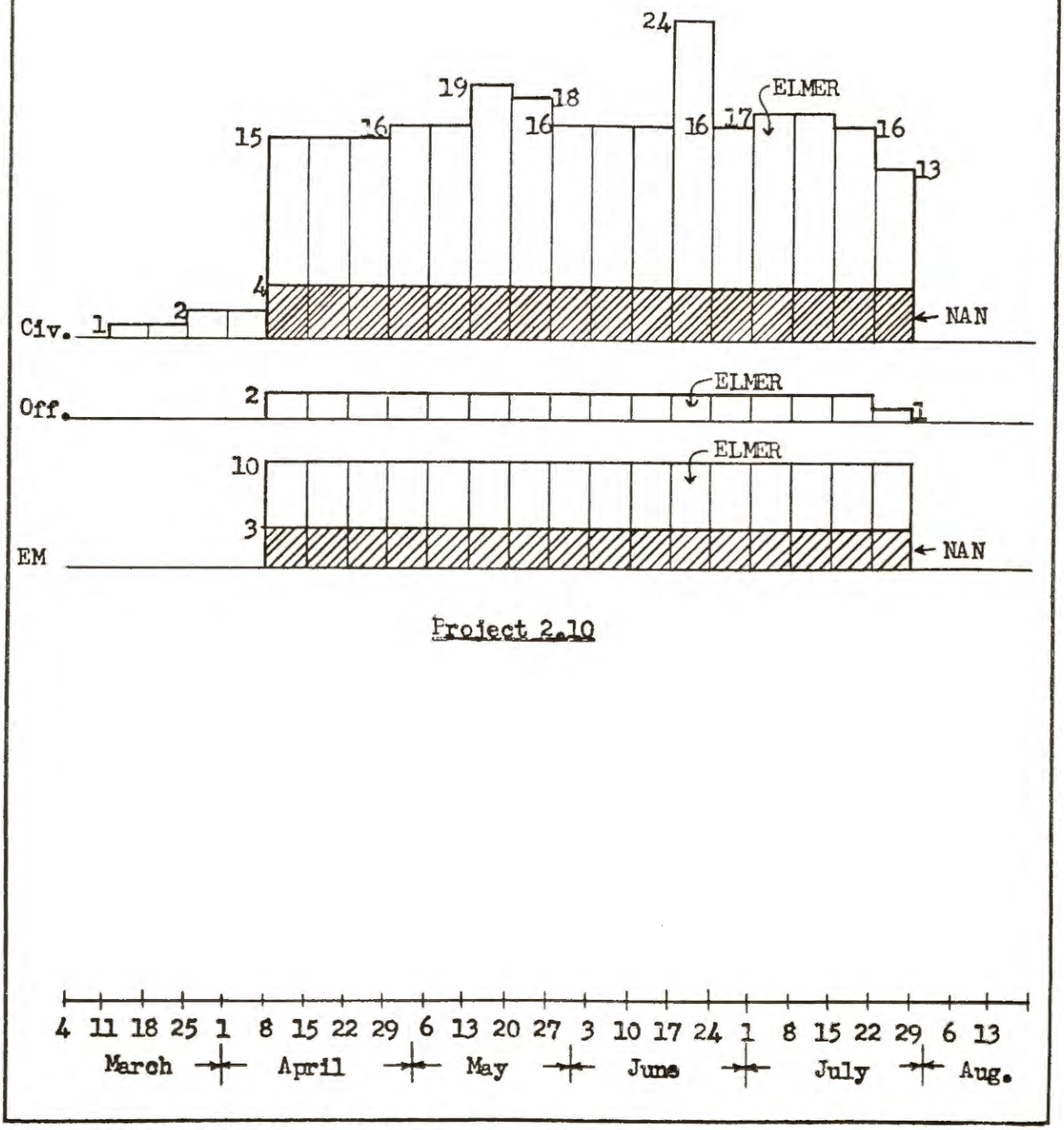
Project 2.8

Project 2.9



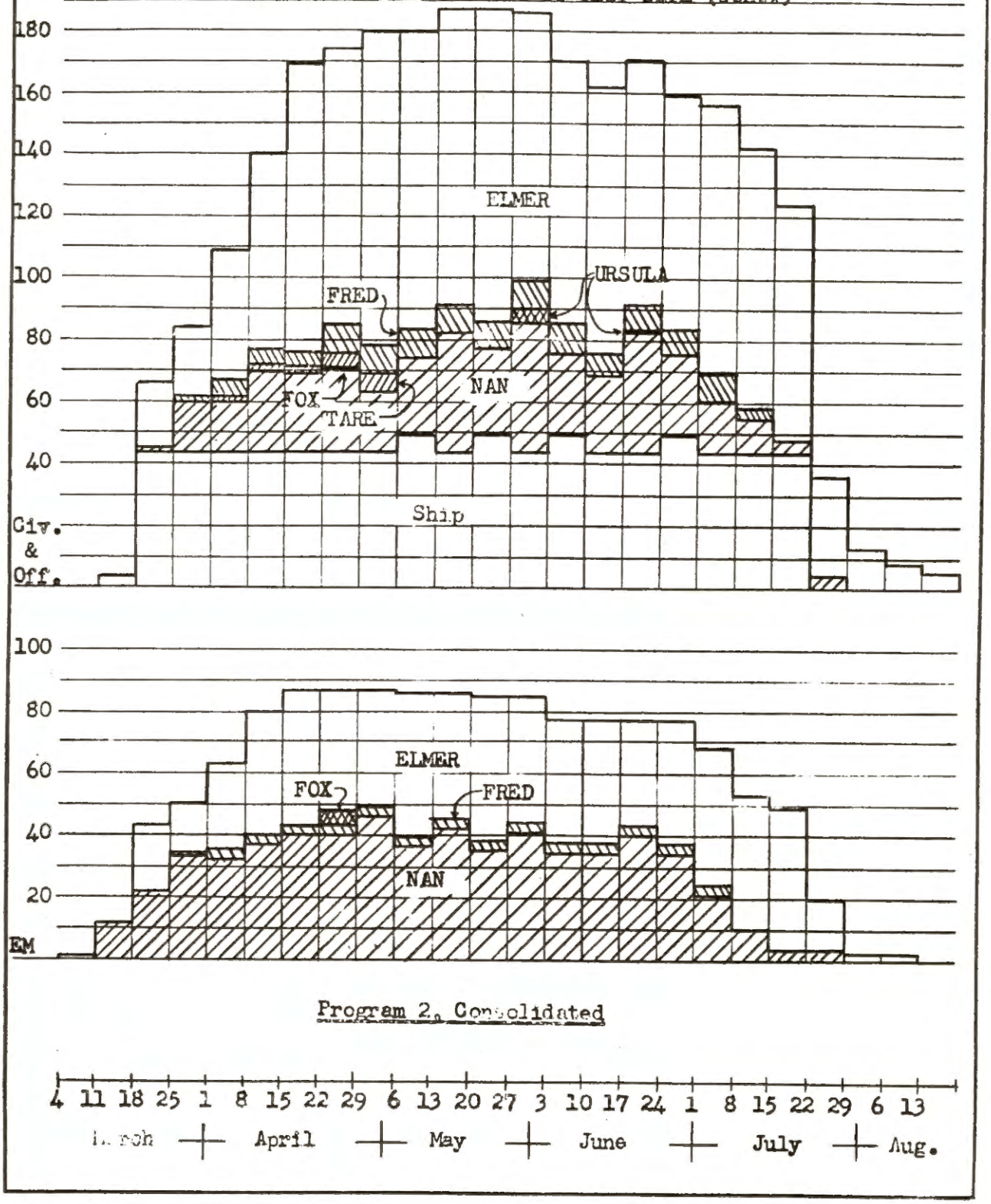
SECTION VII - C

PERSONNEL TIME PHASING TO TEST SITE (Cont.)



Project 2.10

PERSONNEL TIME PHASING TO TEST SITE (Cont.)



Program 2, Consolidated

PART VIII
BUDGET

SECTION III

Project	Laboratory	Funding Agency	PROGRAM II BUDGET								
			A.F.S.W.P. R&D FUNDS						Project Funds	Extra Military Funds	Total
			Class I	Class II			TEWA* Increase	Total			
				P.D. & Travel	R. Cargo	Const or Support					
2.1	ESL	SCEL	54,175	10,550	2,000	7,360	0	74,085	0	0	74,085
2.2	ESL	SCEL	126,000	12,000	7,000	7,020	0	152,020	0	0	152,020
2.4	CWL	ACC	43,525	5,325	4,350	9,000	0	62,200	0	0	62,200
2.51	CWL	ACC	173,200	16,500	3,400	59,000	0	252,100	0	0	252,100
2.52	SC		0	0	0	4,400	0	4,400	0	0	4,400
2.61	NRDL	BuS	757,780	8,400	1,100	31,000	0	798,280	35,500	0	833,780
2.62	SIO	ONR	662,060	0	0	2,000	0	664,060	0	27,081	691,141
2.63	NRDL	BuS	948,000	48,500	1,500	48,500	0	1,046,500	273,500	193,000	1,513,000
2.64	NYOO	AEC	74,000	0	0	11,000	5,000	90,000	0	0	90,000
2.65	CWL	ACC	139,500	31,000	4,500	12,745	25,000	212,745	0	0	212,745
2.66	SWC		125,805	11,594	1,502	300	5,000	144,201	51,159	0	195,360
2.7	NRDL	BuS	22,450	8,500	0	0	0	30,950	192,750	13,600	237,300
2.8	NRDL	BuS	42,500	6,500	0	1,000	0	50,000	100,200	0	150,200
2.9	BuS	BuS	9,000	5,000	0	0	0	14,000	15,700	0	29,700
2.10	NRDL	BuS	99,500	30,600	0	37,000	0	167,100	123,800	153,400	444,300

*Increase for TEWA participation on which breakdown into Class I & II has not been received from project.

PART IX
REPORTS

SECTION IX

PRELIMINARY REPORT DUE DATES

Project	Report Title	Due Date
Program 2	Consolidated Preliminary REDWING Fall-out Observations	17 July
2.1	Gamma Exposure vs. Distance	8 July
2.2	Gamma Rate vs. Time	8 July
2.4	Decontamination and Protection	12 June
2.51	Neutron Flux Measurements	25 June
2.52	Neutron Induced Soil Radioactivity	8 May
2.61	Rocket Determination of the Activity Distribution Within a Stabilized Cloud	25 June
2.62	Fall-out Contours by Oceanographic Analysis	21 July
2.63	Characterization of Fall-out	21 July
2.64	Fall-out Location and Delineation by Aerial Surveys	21 July
2.65	Land Fall-out Studies	21 July
2.66	Early Cloud Studies from Aircraft Penetrations	8 July or 14 July
2.7	Ship Shielding Studies	28 June
2.8	Shipboard Countermeasures Methods Studies	29 May
2.9	Standard Recovery Procedure for Tactical Decontamination of Ships	21 July
2.10	1. Verification of Washdown Effectiveness as a Shipboard Radiological Countermeasure	14 July
	2. Ship Operations	14 July

NOTE: All preliminary reports will be completed prior to departure from the forward area.